

Abstract & Programme Book



25th-26th February 2025
Mercure Living Putrajaya

1ST INTERNATIONAL CONFERENCE ON SOCIAL INNOVATION IN DESIGN AND BUILT ENVIRONMENT

“Integration of Design and Built Environment in Fostering Social Innovation and the Interplay between Physical Spaces and Societal Progress”

Organised by :



UPM
UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

FAKULTI REKABENTUK DAN SENIBINA
FACULTY OF DESIGN AND ARCHITECTURE
فاكولتي ريبك بنتوق دان سني بينا

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Program: Day 1

Tuesday | 25 February 2025

- 8:30 am **Registration**
- 8:45 am **Arrival of guests**
- 9:00 am **Arrival of Guest of Honour**
- YB Datuk Ts. Mustapha Sakmud, Deputy Minister, Ministry of Higher Education, Malaysia.
 - YBhg. Dato' Profesor Dr. Ahmad Farhan Mohd Sadullah, Vice Chancellor, Universiti Putra Malaysia
 - YBrs. Dr. Noraishah Mydin Abdul Aziz, Member, Board of Directors, Universiti Putra Malaysia,
 - YBrs. Prof. Madya Ts. Gs. Dr Mohd Johari Mohd Yusof, Dean, Fakulti Rekabentuk dan Senibina, Universiti Putra Malaysia
- 9:15 am *Negaraku & Putra Gemilang and Duaa recitation*
- 9:25 am **Welcoming Speech by**
YBhg. Dato' Profesor Dr Ahmad Farhan Mohd Sadullah, Vice Chancellor, Universiti Putra Malaysia.
- 9:35 am **Conference Opening**
YB Datuk Ts. Mustapha Sakmud, Deputy Minister, Ministry of Higher Education, Malaysia.
- 9:45 am **Keynote 1**
Dato' Professor Dr. Ahmad Farhan Mohd Sadullah
"The Role of Social Innovation in the Built Environment"
- 10:15 am Presentation Of Honorarium & Photography session
- 10:30 am Press Conference & Tea break
- 10:45 am **Keynote 2**
Adjunct Prof. Ar. Adrianta Aziz (PAM President 2024-2025)
"Future Cities: Integrating Social Innovation"
- 11:50 am **Forum 1: Current Trends and Future Directions in Social Innovation.**
Panels:
- Prof. Dr. Veronica Ng Foong Peng (Sunway University)
 - Dr. Afnizanfaizal Abdullah (MRANTI)
 - Ar. Dr. Tan Loke Mun (Director Archicentre Sdn Bhd)
- 'SiDe Design Economy Round Table Discussion'**
Discussion on 'White Paper on Design Economy', led by Prof. Madya Ts. Dr. Mohd Zairul b Mohd Noor
- 1.00 pm **Lunch break**
- 2.15 pm **Parallel Session 1**
- 5.30 pm **Break**
- 8.00 pm **SiDe 2025 Networking Dinner**

Program: Day 2

Wednesday | 26 February 2025

- 8.00 am **Keynote 3**
Mrs. Anja Juliah Abu Bakar (Athena Holdings Sdn. Bhd.)
Innovation Case Studies: Success Stories and Lessons Learned
- 9.00 am **Forum 2: The Future of Social Innovation in Design and Built Environment**
Panels:
- *Dr. Sharmila Salleh (CEO Yayasan Inovasi Malaysia)*
 - *LAr. Phua Chin Eng (Landart Design)*
 - *En. Shin Tseng (Director of Urban Agenda Design Group)*
- 10.00 am **Break**
- 10.15 am **Parallel Session 2**
- 1.00 pm **Lunch break**
- 2.00 pm **Parallel Session 3**
- 5.00 pm **Prize Giving and Closing**
- 6.00 pm **Conference ends**



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Foreword: Dean

1st International Conference on Social Innovation in Design and Built Environment (SiDe) 25 - 26 February 2025

It is my great pleasure to extend a warm welcome to all participants of the 1st International Conference on Social Innovation in Design and Built Environment (SiDe-2025). This conference marks a significant milestone in our collective journey towards fostering social innovation in the design and built environment disciplines. As we navigate an era of rapid urbanization and environmental challenges, it is imperative that we reimagine the way we design spaces, develop infrastructures, and shape communities to be more resilient, inclusive, and sustainable.

The Faculty of Design and Architecture, Universiti Putra Malaysia (UPM) has long been at the forefront of advancing research, education, and professional practice in these fields. With the increasing prominence of the creative economy, fostering meaningful collaborations between academia, industry, and policymakers is more crucial than ever. By working together, we can unlock new economic opportunities and drive transformative change for a better-built environment.

The theme of SiDe-2025 highlights the essential role of design and built environment professionals in shaping socially responsible and forward-thinking solutions. Social innovation is not just about technological advancements—it is about creating meaningful, human-centered solutions that enhance quality of life, promote sustainability, and strengthen community resilience. This conference serves as a dynamic platform for scholars, practitioners, and policymakers to engage in insightful discussions, share cutting-edge research, and exchange transformative ideas that will propel our field forward.

I extend my heartfelt appreciation to the organizing committee, keynote speakers, panelists, and all participants who have dedicated their time and expertise to making this event a success. Your commitment to social innovation in the built environment is truly commendable, and I look forward to the impactful discussions and collaborations that will emerge from this conference.

Let SiDe-2025 be a catalyst for new perspectives, groundbreaking innovations, and lasting partnerships, paving the way for a more sustainable, inclusive, and socially innovative future. Wishing you all a productive and inspiring conference.

Foreword: SiDe 2025

Chairman

Dear Esteemed Participants,

It is with great pleasure that I invite you to the SIDE Conference, a premier platform dedicated to exploring social innovation in design and the built environment. As Malaysia navigates the evolving landscape of the creative economy, this conference serves as a catalyst for transformative ideas, cross-disciplinary collaboration, and impactful solutions that can drive economic growth and social progress.

The creative economy holds unlimited potential to shape the future of our cities, industries, and communities. By leveraging design thinking, digital innovation, and sustainable strategies, we can create new economic opportunities, enhance urban resilience, and improve quality of life. The SIDE Conference brings together industry leaders, academics, policymakers, and innovators to engage in insightful discussions, share groundbreaking research, and foster meaningful partnerships.

I encourage researchers, professionals, entrepreneurs, and students to participate actively—whether by presenting papers, joining panel discussions, or networking with like-minded changemakers. This is your opportunity to contribute to a future where design, technology, and sustainability converge for societal impact.

Let us push boundaries, challenge conventional practices, and redefine the role of design and the built environment in shaping a more inclusive and innovative Malaysia. I look forward to your participation and valuable contributions.

Warm regards,

Assoc. Prof. Ts. Dr. Mohd Zairul bin Mohd Noor

Chairman, SIDE Conference



‘1ST INTERNATIONAL CONFERENCE ON SOCIAL INNOVATION IN DESIGN AND BUILT ENVIRONMENT’ (SIDE) 2025

Conference Theme

- THEME 1*** SUSTAINABLE URBAN DEVELOPMENT (SUD)
- THEME 2*** CULTURAL HERITAGE AND CONTEMPORARY DESIGN (CHCD)
- THEME 3*** HEALTH AND WELL-BEING IN BUILT ENVIRONMENT (HWB)
- THEME 4*** TRANSFORMING SOCIAL BUILT ENVIRONMENT (TSBE)
- THEME 5*** HUMAN-CENTERED DESIGN & ENGAGEMENT (HCDE)



**A. THEME 1: SUSTAINABLE URBAN
DEVELOPMENT (SUD)**

SUD-A1 SUSTAINABILITY INTEGRATION FOR EFFICIENCY AND WELL-BEING IN OPTIMIZING ARCHITECTURAL WORKSPACES: MALAYSIAN ARCHITECTS' PERSPECTIVES

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This qualitative study explores the perspectives of ten Malaysian architects on integrating sustainable design elements in architectural workspaces to enhance efficiency and well-being. Sustainability has become a critical focus in contemporary architectural practices, emphasizing the balance of environmental, social, and economic factors. However, a gap persists in understanding how sustainable design principles can be effectively applied within workspaces to simultaneously optimize functionality and improve occupant well-being. Using semi-structured interviews, the research examines the architects' perceptions, challenges, and strategies related to sustainability in workspace design. The findings highlight varied viewpoints on sustainability's significance, encompassing environmental stewardship, occupant comfort, and productivity. The study underscores the need for holistic strategies that harmonize environmental priorities with occupant well-being, fostering the creation of more sustainable and efficient architectural workspaces.

Keywords: architectural workspaces, architecture consultancy practice, sustainable development goals, sustainable workspace, well-being

SUD-A2 A REVIEW OF THE BENEFITS AND DRAWBACKS OF FLOOD RESILIENCE IN THE NETHERLANDS

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This paper looks at the ability of Dutch flood strategies to withstand evolving circumstances in an era of intensifying climate change. By using both historical lessons and models rooted today, those structures might protect against damage through theoretical efficacy improvements that could not be reached. Although historical investments such as the Delta Works and "Room for the River" have greatly reduced flood risks, these measures come at a high cost to maintain. The objectives of this paper include assessing the effectiveness of existing control measures, analysing financial and environmental impacts, and exploring nature-based solutions' potential. A systematic review of literature from 2020-2024 was conducted using databases like Scopus and ScienceDirect, with tools such as Mendeley for citation management and Covidence for screening and data extraction. It is, however, seems traditional infrastructures work fine and dandy but require way too much maintenance. For nature-based solutions, the potential is high but further policy support for their application at scale is needed. This research emphasises an adaptive balance between technological discovery and engendering ecological sustainability as well as societal justice when considering future flood management policies.

Keywords: Flood Resilience, Climate Adaptation, Delta Works, Nature-based Solutions, Netherlands

SUD-A3 GRADIENT FEATURE EXTRACTION OF LOW-CARBON URBAN LANDSCAPE PATTERN VIA SCENE REGISTRATION

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Conventional gradient feature extraction method of spatial pattern of low-carbon urban landscape has the problem of unclear type of low-carbon urban structure, which leads to a low aggregation index. A gradient feature extraction method of spatial pattern of low-carbon urban landscape based on scene registration is designed. Describe the combination characteristics of landforms, obtain landscape type index, calculate carbon emissions, identify low-carbon urban structure types, optimize the planning process of landscape spatial pattern with target detection algorithm, determine the best location and area of green space, evaluate image similarity, and extract gradient features with scene registration technology. Experimental results: Compared with the other two extraction methods, the average clustering index of gradient feature extraction method of spatial pattern of low-carbon urban landscape in this paper was 59.752, 51.590 and 50.531, respectively, which proved that the gradient feature extraction method of spatial pattern of low-carbon urban landscape integrated with scene registration technology was more practical.

Keywords: Scene Registration, Low-carbon City, Landscape Spatial Pattern, Gradient Characteristics, Extraction Method, Target Detection Algorithm

SUD-A4 URBAN FARMING IN VACANT LAND FOR SUSTAINABLE DEVELOPMENT: A SYSTEMATIC REVIEW

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As urbanization has accelerated since the 21st century, generating a large amount of vacant land that hinders sustainable urban development. Urban farming emphasizes the use of existing vacant land in the city. However, its contribution to the city's production function, economic benefits, and social value still lacks a comprehensive discussion. The results show that the hot topics on urban farming in vacant land in the last decade have been almost exclusively centered on sustainability and have been published in countries concentrated in the United States and some countries in Europe. We categorized the articles into seven themes corresponding to the United Nations and the Sustainable Development Goals (SDGs). Food security and improved nutrition were the most discussed, followed by urban sustainability. Quality was the least mentioned. While there is a substantial basis for a positive benefits perspective, there are still gaps in quantitative assessments and in-depth case studies on sustainable contributions.

Keywords: vacant land, urban farming, sustainability

SUD-A5 STRATEGIES ON INTEGRATING SALVAGED MATERIALS INTO THE BUILT ENVIRONMENT PROGRAMME

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Salvaged materials have the potential to be integrated as an educational resource and transform into a sustainable solution for Higher Educational Institution. According to UCSI University's Sustainability Report 2023, the university's total collected waste saw an increase of 7.54% within a span of 6 years from 2018 to 2023. The amount of waste from the Built Environment students' work that is mismanaged can lead to serious problems, such as space issues, safety concerns, and visual unpleasing. The lack of awareness for salvaging materials and limited understanding of their significant value prevents resource reuse. This study aims to reuse salvaged materials as education resources for the Built Environments programmes. Literature review was carried out to discover the types of reusable materials, concept of sustainability and strategies for salvaged materials. A semi-structured interview was conducted with 25 academic staff members. Content analysis technique was done to obtain all the data from the respondents. The findings from interviews provided a clear evidence on the current sustainable practices and strategies to encourage the use of salvaged materials. The finding of this research can contribute to better understanding on revaluing materials, prolonging its usage and the potential of implementing a circular material resource centre.

Keywords: Salvaged Materials, Sustainable Campus, Education Access, Solid Waste, Resource Reuse, Resource Efficiency

SUD-A6 LANDSCAPE ARCHITECTURE FRAMEWORK FOR SUSTAINABLE AGRICULTURE PRACTICE AND FOOD SECURITY: CASE STUDY OF UAIL

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Global food security has remained a pressing concern worldwide despite advancements in agriculture technology. The paper aims to contribute to the development of a sustainable agriculture framework through landscape architecture exemplified USAS Agriculture Industry Laboratory project under Universiti Sultan Azlan Shah (USAS) to overcome food security. The project will benefit USAS and the local community and enhance the site's environment. Three key issues related to the site: the degradation of the agro-tourism industry, the pressure of surrounding development on ecosystem services and the underutilization of the site's capabilities. Geo-morphological study and content analysis methods have been implemented in this research. The findings and recommendations were to create a sustainable agriculture framework that offered sustainable landscape design and developed a sustainable food security model to fulfil the design strategies. It contributes to agricultural land and practices by highlighting the importance of improving food security issues, sustainable agricultural site design and framework.

Keywords: Food security, Sustainable agriculture, Sustainable landscape framework, Landscape practice, Green design

SUD-A7 THE ASSESSMENT OF RISK MANAGEMENT MATURITY IN LANDSCAPE ARCHITECTURE PROJECT ORGANISATION

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The Malaysian landscape project is underutilized due to a lack of awareness and awareness of its benefits, leading to reluctance to implement risk management. Different risk management approaches are implemented based on the nature of the initiative, resource allocation, and organizational policies. A formal risk management application is needed to address ineffective practices and improve decision-making. The current organization's culture and management are crucial factors in risk landscape project application. Understanding risk management maturity is essential before implementing a formal system. Risk management maturity is divided into four levels: Naive, Novice, Normalized, and Natural. Semi-structured interviews with twenty-four Malaysian landscape architecture organizations revealed that most organizations scaled their risk maturity level at Level 1. The lack of a formal risk management practice and a lack of awareness about the importance of risk management in landscape projects highlights the need for improvement.

Keywords: Risk Management Maturity, Risk Management, Landscape Project, Landscape Architecture Organization

SUD-A8 WEAVING THE NARRATIVE OF RESETTLEMENT SUCCESS: A THEMATIC REVIEW

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Displaced individuals often find themselves detached from their communities, socioeconomic resources, and cultural values. Displacement is commonly brought about by the absence of thorough resettlement frameworks that can promote fairness and influence the livelihoods of these individuals. Previous research contended that mere legislation is insufficient to protect people's welfare and livelihood, and there is an urgent requirement to transition from well-intentioned laws to effective practices. Therefore, this paper aims to assess and examine the elements that affect resettlement results and influence resettlement success in studies conducted between the years 2020 and 2024. A thematic analysis was conducted on relevant literature published between the years 2020 and 2024. The results showed that there are five (5) factors influencing resettlement success and community livelihood: (1) governance and policy framework; (2) community and social dynamic; (3) economic and livelihood consideration; (4) infrastructure and physical environment; and (5) education and long-term support. These findings highlighted that resettlement is not merely a logistical challenge but a profoundly social, economic, and cultural issue.

Keywords: resettlement, sustainable livelihood, community adaptation, forced displacement, thematic review

SUD-A9 ASSESSING REVITALISED ALLEYS: DETERMINATION ON FACTORS INFLUENCING QUALITY OF ALLEYS IN MALAYSIA

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Alleys are vital public spaces that enhance social interaction, cultural expression, and urban vibrancy. However, many alleys in Malaysia's historic districts remain underused and neglected. Recognising their potential as functional socio-spatial areas and tourism assets, revitalisation initiatives have been implemented. This study aims to identify key variables contributing to alley quality and determine factor that would significantly influence alley quality. Five key variables including Accessibility, Safety, Comfort, Cultural Significance and Social Interaction, and Green Environment are identified through systematic literature review. The variables then integrated into 21-item questionnaire. 197 respondents were engaged across 18 revitalised alleys in Penang, Perak, and Terengganu. The collected data underwent analysis using linear regression analysis, with R Square value of 0.60, and the reliability of questionnaire were ensured through Cronbach's Alpha (0.694). The study identified the needs of improving 'accessibility' to enhance alley quality. The study concludes with recommendations for urban planners and decision-makers to optimise the potential of revitalised alleys as valuable urban assets.

Keywords: alley revitalisation, heritage districts, public spaces, measurement tool, urban planning, user experience

SUD-A10 DYNAMIC SPACES, DYNAMIC CITIES: EXPLORING CREATIVE PLACEMAKING TRENDS IN URBAN DEVELOPMENT

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Creative placemaking is a transformative urban development approach that combines arts, community engagement, and revitalisation to build vibrant, sustainable cities. This approach has gained momentum worldwide, aiming to nurture creativity, improve public spaces, and stimulate economic development. Despite the increasing interest in this approach, especially among development stakeholders, there remains a necessity for a comprehensive analysis of the practices and trends currently emerging in the field of creative placemaking, particularly in urban development, between 2019 and July 2024. The results highlight a strong focus on interdisciplinary strategies linking creative industries with economic growth and social cohesion, underscoring the impact of participatory approaches in enhancing community identity and promoting social sustainability. By offering insights for urban planners, policymakers, and scholars, this study advocates for inclusive urban renewal practices. Future research should explore the long-term impacts of creative placemaking, especially its potential to address complex social challenges and drive urban regeneration across diverse contexts.

Keywords: Creative placemaking, urban development, community engagement, urban regeneration, cultural sustainability

SUD-A11 EXPLORING TRENDS IN MARKETPLACE DEVELOPMENT: A THEMATIC REVIEW

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Marketplaces play a crucial role in urban environments, serving as centres for economic activity, cultural exchange, and community interaction. Despite their significance, there is a lack of comprehensive understanding regarding the marketplace's development, particularly on cultural preservation. This study aims to explore the roles of marketplaces, focusing on analysing the current research trends that are vigorous in contributing to marketplace development as a whole. The review focuses on the significance of the marketplace in urban design settings. A thematic review was conducted, synthesising findings from various studies that examine the current research trend of sustainability, governance, and the social roles of marketplaces. The review identifies key themes, including the necessity of adopting circular economy principles, the importance of flexible governance structures, and the role of marketplaces in fostering social cohesion and cultural heritage. It highlights that effective urban design can enhance market functionality while promoting environmental sustainability. This research contributes to the existing literature by providing a holistic perspective on marketplace development, emphasising the interconnections of sustainability, governance, and cultural preservation. Future research should prioritise the cultural and social significance of marketplaces, focusing on how these spaces can adapt to urbanisation while preserving their cultural

heritage. Investigating community participation in marketplace design and governance can enhance social cohesion and support local traditions. Additionally, the intersection of governance and policy implications requires further exploration, particularly in developing flexible regulatory frameworks that address contemporary challenges and environmental sustainability. Collaborative approaches involving stakeholders at all levels can foster resilient marketplace operations, ensuring these vital spaces remain vibrant, culturally significant, and responsive to the needs of urban communities.

Keywords: Urban Marketplaces, Sustainability Practices, Governance Frameworks, Cultural Preservation, Urban Design



SUD-A12 IMPACT OF LAND USE ON THE ECOSYSTEM SERVICE VALUE OF WETLANDS: A THEMATIC REVIEW

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This study systematically examines research findings on the correlation between land use change and wetland ecological service value (ESV) from 2015 to 2024. Through the establishment of stringent inclusion and exclusion criteria, 52 qualifying studies were identified from databases including Web of Science, Google Scholar, Scopus, and ATLAS. It was utilised for comprehensive qualitative analysis. The research identified six major themes: (1) The effects of land use change on wetland ecosystem services; (2) Wetland ecological services; (3) Assessment techniques for ecological services; (4) The influence of urbanisation on ecological services; (5) Wetland conservation and management; (6) Management strategies. The findings indicate that alterations in land use substantially influence wetland ecosystem services, including biodiversity, climate regulation, and community support, therefore offering a crucial reference for the valuation of ecosystem services and the formulation of sustainable wetland management strategies.

Keywords: Land Use Change, Ecosystem Service, Wetland, ATLAS.ti

SUD-A13 TRADITIONAL MARKET AS CULTURAL MILIEU ATTRIBUTED BY ITS SOCIAL VIBRANCY AND SOCIAL MEANING

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The traditional market becomes a spatial component that cannot be separated from the city of Yogyakarta and its life. Its vibrancy is generated by people's behavior in forming the social space of the traditional markets, including Ngasem and Senen. This study is based on the theory of the Place Process. Data were elicited by snapshots and observations indicating social activity, layout, and elements in the transitional spaces. Next, this research showed that the traditional market becomes an existential, pragmatic, and perceived space. Its place process relates to the different social and cultural values. Moreover, its ambiguity modifies the place function and creates the socio-spatial phenomena. It is invested in understandings of social meaning and social vibrancy. These attributes can be spatial, temporal, or even habitual. Its social spaces are formed spontaneously or even intentionally. The traditional market is a cultural milieu sustained through social meaning and cultural expressions.

Keywords: traditional market, cultural milieu, ambiguity space, place process

SUD-A14 WOMEN'S SAFETY PERSPECTIVES: TOWARDS RETHINKING URBAN STREET DESIGN

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Women's security and safety in cities continue to be a major concern around the globe. With its rapid urbanisation, Kuala Lumpur needs to be made a safer city for women by fully and actively supporting women's participation in the public realm. Women's perspectives and needs must be accounted for in urban streets and infrastructure design and planning. In places like Jalan Bukit Bintang, Jalan Tunku Abdul Rahman, and Jalan Imbi, where crimes and violence against women are most prevalent, this study focuses on women's perceptions of safety and how they use the urban streets. The study utilises quantitative and qualitative methods to comprehensively understand women's perceptions of safety in the city and how urban street design can be improved to address these concerns. This implies the potential of providing useful information to urban planners and policymakers in Kuala Lumpur and other cities elsewhere, the ultimate contribution of a safer and more inclusive environment for all genders. Future research could investigate cross-cultural comparisons of women's safety in cities, enabling a broader understanding of best practices and globally adaptable solutions.

Keywords: Gendered spaces, Perceptions of safety, Safe city, Urban streets, Women's security

SUD-A15 IMPROVING URBAN STREETSCAPE DESIGN GUIDELINES BY INCORPORATING STREET VENDOR FACTORS: A REVIEW

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In the face of rapid urbanization, the influx of large numbers of rural migrants has reshaped urban dynamics, and the unexpected outbreak of the COVID-19 epidemic has further highlighted the importance of street vendors. They have brought vitality and diversity to urban streetscapes, but also problems of congestion and chaos. Therefore, this study aims to integrate street vendors into the design of urban streetscapes, analysis the social networks of street vendors to explore their behavioral patterns and more accurately reveal the interaction mechanism between vendors and streetscapes, and propose strategies to optimize street design to enhance the working comfort and experience of vendors while reducing interference with street order. To balance the relationship between street vendor activities and the urban streetscape environment. On the basis of maintaining the positive impact of street vendors, the quality and function of urban streetscapes should be improved. The article suggests that future urban streetscape design should pay more attention to the social network relationship of street vendors and achieve harmonious coexistence between street vendors and urban streetscapes. The ultimate goal is to promote win-win development between street vendors and the wider urban community.

Keywords: Urban streetscape, street vendors, social networks, streetscape design, street vendor management

SUD-A16 DEVELOPING A RECYCLING FRAMEWORK FOR HORTICULTURE WASTE MANAGEMENT IN THE CONTEXT OF A CIRCULAR ECONOMY

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The symbiotic relationship between urban development, green spaces, and ecological sustainability has underscored the critical need for effective recycling of horticulture waste management within a circular economy (CE) framework. Mismanagement of horticulture waste contributes to pollution and greenhouse gas emissions such as methane gas and carbon dioxide, posing environmental and health risks. This study uses a systematic literature review to identify gaps in horticultural waste management and establish a theoretical foundation for integrating circular economy principles into sustainable landscape practice. An optimization model is then developed by applying advanced analytical techniques and integrating advanced strategies to enhance compost quality, improve soil remediation practices, and optimize waste logistics. The findings support the development of innovative recycling and upcycling strategies, addressing technological challenges and fostering collaborative research. The study provides actionable insights for stakeholders, including policymakers, urban planners, landscape practitioners, and environmental advocates, to support circular economy initiatives and promote landscape sustainability effectively.

Keywords: Horticulture waste management, Circular Economy, Sustainable landscape management, Recycling strategies, Waste valorization

SUD-A17 ASSESSING THE SUITABILITY OF VARIOUS ECOLOGICAL FLOOD MITIGATION METHODS ACROSS DIVERSE CLIMATES

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This paper focuses on analysing the evolving ecosystem-based flood management solutions, focusing on wetland restoration to green infrastructures and mangrove reforestation, in different geographical locations having diverse climate settings. The goals of the study are to categorise flood mitigation strategies based on region, evaluate their effectiveness, and determine the pros and cons of each technique. A systematic review following PRISMA guidelines was conducted to ensure thorough literature identification, selection, and synthesis. Studies from 2020 to 2024 were sourced from Scopus and ScienceDirect, focusing on ecological flood control methods. Findings reveal that nature-based solutions significantly reduce flood risks while supporting biodiversity, though their success varies by climate. For instance, wetland restoration succeeded in the temperate and tropical regions but there was a hindrance from urban green infrastructure for extreme weather zones. By assessing the appropriateness and efficacy of ecological flood mitigation strategies in diverse climates, this review also addresses gaps in present research to provide new perspectives for adaptive and sustainable flooding management.

Keywords: Flood, Ecological, Climate, Mitigation, Effectiveness

SUD-A18 ASSESSING CUMULATIVE AND TIME-LAGGED EFFECTS OF VEGETATION TO EXTREME WEATHER IN THE LIUJIANG RIVER TRIBUTARY ECOSYSTEM

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The Liujiang River Basin, a vital part of the Pearl River Basin, faces significant impacts on vegetation quality due to frequent extreme weather events. However, the cumulative and time-lag effects of vegetation responses to climate factors remain underexplored. This study analyzes vegetation dynamics (1986–2024) in the Liujiang tributaries, focusing on extreme rainfall and temperatures. Using Theil-Sen trend analysis, Mann-Kendall tests, and cross-correlation analysis, it examines NDVI trends, time-lag effects, and spatial heterogeneity of cumulative impacts. Results indicate a slow overall NDVI increase, with significant degradation in farmland and urban expansion areas. Vegetation exhibits a longer lag response to rainfall (2–3 months) compared to temperature (about 1 month). Spatially, forests and mountain vegetation positively respond to cumulative effects, while urban and farmland areas are more vulnerable to negative impacts. This study offers insights into vegetation responses to extreme weather, guiding ecological management and climate adaptation strategies for the basin.

Keywords: Extreme precipitation, Extreme temperature, Time-lag and accumulative effects, Vegetation type

SUD-A19 AGENT-BASED MODELLING IN THE IMPACT OF URBAN SPACE USE ON PEOPLE'S BEHAVIOUR: A BRIEF LITERATURE REVIEW

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Traditional approaches to urban design tend to ignore the temporal dynamics of urban space use, and the study of people's behaviour in the context of urban space design is particularly important in today's urban research. ABM is a tool for studying social phenomena through computer simulations of interactions between individual agents (agents). In this way, ABM is able to reveal how simple rules can produce complex and unexpected behaviours. Therefore, the aim of this paper is to explore the impact of urban space use and its environmental factors on people's behavioural patterns, and to analyse the potential and challenges of agent-based modelling (ABM) in studying the relationship between urban space and human behaviour.

Keywords: Urban space use, People's behaviour, Agent-based modelling

SUD-A20 LAND USE/COVER CHANGE AND ITS IMPACT ON CARBON STOCK IN YELLOW RIVER BASIN FROM 2000 TO 2020

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The Yellow River Basin serves as a crucial ecological corridor and carbon sink in China. Despite concerted efforts towards ecological restoration, the growth of carbon stocks had been hindered by the impacts of climate change and human activities. Land use/cover changes (LUCC) play a significant role in altering ecosystem structure and processes, thereby influencing carbon stock dynamics. This study employed the InVEST model to analyze land use data from 2000, 2010, and 2020 for calculating changes in carbon stocks. The findings indicate that: (1) minimal alterations were observed in cropland, grassland, forest, and water areas, whereas significant shifts occurred in built-up and unused land; (2) fluctuations in carbon stocks were primarily attributed to changes in built-up and unused land; (3) the transform of forests, grasslands, and croplands resulted in the most substantial changes in carbon stocks.

Keywords: Yellow River Basin, Carbon Stock, Land Use, InVEST Model

SUD-A21 OFFICE BUILDING SOLAR PV APPLICATION: A CUTTING-EDGE SCIENCE MAPPING ANALYSIS

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Solar PV application within office buildings has been raising concerns in recent years, where the demand for related scientific research is growing. Hence, the purpose of this study is to investigate future trends in the usage of solar PV in office buildings. The Web of Science database was searched for 648 papers published between 2018 and 2022 that focused on solar PV applications in office buildings. A bibliometric review, including network mapping analysis with VOS Viewer software, was carried out. The results highlight frequently utilized keywords pertaining to solar PV application in office buildings. Five clusters of themes were represented by groups of keywords. Among the cluster's themes identified are 1) Enhancement of solar PV, 2) Thermal performance of solar PV, 3) Energy efficiency of solar PV, 4) Energy and heat storage of solar PV, and 5) Solar PV in various nations. Besides, the top 15 of the recurrent keywords related to the topic were also presented. The study also investigated the correlation between solar PV performance and efficiency, as well as the insight on the emerging innovation of solar PV technology. Findings revealed that, theoretically, researchers could concentrate more on areas for improvement and gaps related to the topic. While practicality, the study could have an impact on governments and businesses in practice.

Keywords: Office building, solar PV, office, PV, Web of Science, bibliometric

SUD-A22 EXPLORING THE FACTORS AFFECTING TREE REMOVAL DECISIONS IN MALAYSIAN DEVELOPMENT AREAS

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Urban development has posed a significant threat to a decrease of tree canopy cover. This study aims to explore the factors affecting tree removal decision in a development area. Understanding the motivations or reasons behind the tree removal decisions is important for preserving the existing valuable trees. The data were gathered via a survey targeting registered landscape professionals from the Institute of Landscape Architects Malaysia (ILAM), using a simple random sampling procedure. This study uses SPSS software to conduct exploratory factor analysis (EFA) and descriptive statistics. The findings indicate that the key factors influencing tree removal decisions are institutional constraints, particularly the lack of specific laws for tree preservation which related to resource availability and procedural complexity. The effective tree management depends on stakeholder coordination, and community involvement. Thus, understanding of the decision-making related to tree removal is crucial to achieve sustainable urban development.

Keywords: tree removal, tree preservation, decision making, urban development

SUD-A23 DEFENSIVE ARCHITECTURE AND ITS IMPACT ON HOMELESSNESS: EVALUATING URBAN DESIGN PLANNING IN KLANG VALLEY

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This research examines the ethical and practical impacts of defensive architecture in urban design, focusing on its impact on homeless individuals in the Klang Valley. Defensive architecture, designed to manage public behavior, often marginalizes populations, particularly the homeless, raising questions about justice, equality, and inclusivity. It restricts access to public spaces and critical services, leading to social exclusion. The study uses a mixed-methods approach, integrating global case studies to identify and classify defensive architecture, analyze its impacts, and assess its design functions in urban design. Quantitative data is collected through public surveys while qualitative data is enhanced by conducting the on-site observations to document the prevalence and forms of defensive architecture. The research aims to inform policy and design decisions to cultivate inclusive and supportive urban environments, including those for the homeless. By working closely with authorities and local communities, the research suggests redefining public facility design to align with justice and inclusivity principles in sustainable urban settings.

Keywords: Defensive Architecture, Homelessness, Urban Design and Planning, Inclusive, Equity

SUD-A24 REVIEW OF BLUE-GREEN INFRASTRUCTURE METRICS AND INDICES TO DEVELOP HOLISTIC APPROACHES FOR DESIGNING, IMPLEMENTING, AND MANAGING RESILIENT SUSTAINABLE URBAN ENVIRONMENTS

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Blue-Green Infrastructure (BGI) refers to design, implementation and management of vegetation (green), water (blue) bodies to create resilient, sustainable urban environments. Architects focus on design of aesthetically pleasing and functional green/blue spaces, other disciplines look at it from a different perspective. Civil /Environmental Engineering focuses on roads, stormwater drainage, sewerage, green roofs, water harvesting systems, flood control, fire safety and water quality. Climate/environmental Science focuses on climate change, global warming, urban microclimates and effective use of BGI to mitigate the risks posed by climate change and biodiversity. Economists focus on the financial implications of BGI and returns on investment. Geospatial Science extensively uses satellite technology, GIS and remote sensing tools to study land usage, heat islands and hydrological patterns. Government bodies focus on policy guidelines, legislation, regulations, implementation land usage and public health. This paper attempts to summarize BGI metrics and indices from different sources and disciplines for analysis and comparison.

Keywords: Blue Green Infrastructure (BGI), Green space per Capita, Tree Canopy Cover (TCC), Urban Biodiversity Metrics, Urban Neighbourhood Green Index (UNGI), Green Infrastructure Spatial Index (GISI)



**B. THEME 2: CULTURAL HERITAGE AND
CONTEMPORARY DESIGN (CHCD)**

CHCD-B1 HERITAGE AND TRANSFORMATION: EVOLUTION OF STREET NETWORK DYNAMICS IN XIANGMEN AREA, CHINA

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Cultural heritage faces significant challenges from rapid globalization and modernization, creating an urgent need to balance preservation with contemporary development. This study examines Suzhou's Xiangmen area, a historic district in the city's ancient core, to analyse changes in its street network and regional functions from 1745 - 2024. Using historical maps from 1745, 1881, 1893, 1906, 1914, 1940, 1960, and 2024, we apply space syntax theory and Depthmap software to assess shifts in street connectivity and accessibility. The findings indicate that the Xiangmen street network has evolved continuously, reflecting shifts in both regional functions and urban morphology. This analysis offers insights into Suzhou's urban development and highlights the spatial dynamics needed to balance heritage conservation with urban growth, providing a valuable perspective for urban planning and cultural preservation efforts.

Keywords: Cultural heritage, Xiangmen area, Street network, Space syntax, Accessibility, Urban morphology

CHCD-B2 UNDERSTANDING THE MEIXI STONE PAIFANG AS A CATALYST OF URBAN IDENTITY AND CULTURAL HERITAGE SYMBOLISM THROUGH THE INTERPRETATION OF THE ICONOGRAPHIC SEMIOTICS METHOD

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Under the dual influences of globalisation and modernisation, the symbolic significance of traditional heritage sites, exemplified by the Meixi Stone Paifang in Guangdong Province, is increasingly complex. This research explores the role of the Paifang as a catalyst of urban identity and cultural heritage symbolism through an iconographic semiotics approach, integrating the Conceptual Reference Model developed by the International Committee for Documentation of Cultural Heritage (CIDOC CRM) and Panofsky's iconography framework. Employing document analysis, field observation, and iconographic interpretation, this research decodes the architectural and symbolic features of the Meixi Stone Paifang. The findings reveal the layered significance of the Paifang as a historical monument and a living cultural asset that embodies Confucian virtues, familial honour, and community values. This research presents a structured model for interpreting architectural symbolism at heritage sites, offering insights into cultural heritage preservation and sustainable urban design.

Keywords: Meixi Stone Paifang, cultural heritage, urban identity, symbolism, iconographic, semiotics

CHCD-B3 AESTHETIC ANALYSIS OF STREET ART: ENHANCING VISUAL QUALITY IN GEORGETOWN HERITAGE SITE, PENANG

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This research explores the impact of street art on the visual quality of George Town, Penang, a UNESCO World Heritage Site, focusing on public aesthetic preferences. It addresses two main issues: the public's attitude towards street art and the characteristics of street art that contribute to aesthetic preference in George Town. Using a quantitative approach, the study incorporates visual analysis and a structured questionnaire, including a photo survey framed within the Q-sort methodology with 140 participants. The results show that most participants view street art positively, with artworks like "Little Children on a Bicycle" receiving high favor. Factors such as color, balance, and pattern enhance the visual appeal. Despite limitations, such as sample size, the research offers valuable insights for integrating street art into urban design. It also emphasizes the need for future studies to include a broader demographic to fully understand its impact on the community and urban aesthetics.

Keywords: Heritage Site, Street Art, Q-sort, Visual Quality, Visual Analysis, Aesthetic Preference

CHCD-B4 THE APPLICATION OF 'DECENTRALIZATION' IN CULTURAL BRAND VISUAL IDENTITY DESIGN: A CASE STUDY OF 'IMPRESSION WEST LAKE'

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"Decentralization" is a concept frequently referenced in thought, literature, art, and Western philosophical discourse, often embodying connotations of opposing authoritative centrality. In this paper, the term "decentralization" is specifically confined to the domain of brand visual identity design, referring to the diminution of the logo's central role and emphasizing design methodologies that prioritize the system and structure of visual identity. Through an empirical analysis of the "Impression West Lake" brand visual identity design, this study elucidates the application of "decentralization" within brand visual identity design. The proposed decentralized design posits that while the center remains, its form and structure have undergone transformation.

Keywords: decentralization, brand visual identity design, digital media, flexible dynamic

CHCD-B5 REIMAGINING TRADITIONAL ORNAMENTATION: INNOVATIVE DESIGN OF THE VERNACULAR ARCHITECTURAL HERITAGE IN NORTHWEST HENAN, CHINA

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The vernacular architectural ornamentation in Northwest Henan is a comprehensive system derived from regional culture and related factors. In order to explore this potential connection and better adapt to the development of the local cultural industry, this paper first analyzes the types of ornamental elements on various components of vernacular architecture. Then, this paper discusses the various factors influencing the formation of motifs, including environmental constraints, the integration of Confucian culture and farming culture, the influence of religious symbols, and the impact of foreign cultures. Based on the document analysis and fieldwork, this paper establishes specific guidelines for innovative design of ornamentation through Focus Group Discussions (FGDs). The research results show that the ornamentation of vernacular architecture is deeply rooted in agrarian culture, with motifs that contain symbolic meanings of the natural surroundings, lifestyles, folklore, and beliefs. Innovative design of ornamentation through multi-dimensional guidelines based on regional culture can promote the development of local cultural industries.

Keywords: Vernacular Architecture; Traditional Ornamentation; Cultural Heritage; Innovative Design; Northwest Henan

CHCD-B6 PARADOXES AND JUXTAPOSITIONS OF ARCHITECTURAL DEVELOPMENT IN BALI IN THE 20TH CENTURY

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It is believed that the modern movement in architecture originated and flourished in Europe before spreading to other parts of the world through various means, including colonization. This had various consequences for locations far from the hub of modernism, and it even influenced modernism itself. This study delves deeper into the development of architecture in the twentieth century by analyzing empirical data. We chose Bali as the case study to analyze this development because it is a place where modernism and tradition interact, influence each other, and merge together. To achieve this, we conducted building surveys and interviews with the buildings and individuals involved. The study's findings revealed that the community went through several stages of negotiation and adjustment before approving or rejecting the contemporary movement. This illustrates that contemporary influences do not follow a linear trajectory from the west to the east. Instead, modernism has gone through an uneasy path in the process.

Keywords: Paradox and juxtapose, modern architecture, architecture in Bali, decolonisation of architecture

CHCD-B7 DIGITAL RECONSTRUCTION OF THE CAMBRIAN ARTHROPOD SIDNEYIA USING ZBRUSH: A MULTIDISCIPLINARY APPROACH INTEGRATING ART AND SCIENCE IN PALEONTOLOGICAL RECONSTRUCTION

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The advancement of digital technology has substantially improved paleontological reconstruction by enabling the non-destructive visual and virtual modeling of fossil specimens. However, these fossils represent the only direct evidence for reconstructions, creating challenges in achieving scientific accuracy when essential structural features of a species are missing. Additionally, balancing aesthetic appeal with scientific accuracy, particularly in popular science contexts, remains a significant issue in paleontological reconstructions. This paper includes interviews with paleontologists, paleoartists, designers, and museum staff. Thematic analysis of these interviews informs a reconstruction process aimed at addressing these challenges by introducing a comprehensive methodology for a paleontological reconstruction workflow framework. This framework supports the creation of high-quality 3D digital models of *Sidneyia* using 3D imaging data and ZBrush software. The outcomes of this research emphasize the importance of scientific dissemination through art, striving to achieve both scientific accuracy and aesthetic value.

Keywords: Paleontological Reconstruction; *Sidneyia*, ZBrush; Multidisciplinary Approach; Paleoart

CHCD-B8 CULTURAL TRANSMISSION OR CULTURAL DISCONTINUITY? STUDENTS PERCEPTION OF CAMPUS CULTURE ESTABLISHED THROUGH LANDSCAPE AT SUSE'S NEW CAMPUS

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The multi-campus model is the development trend of Chinese university construction but may disrupt campus culture inheritance. This study selected the new campus of Sichuan University of Science & Engineering as a case to understand students' perceptions of campus culture established by the landscape and to explore its effectiveness in culture transmission, as a basis for future decision-making in new campus construction. The study applied stratified purposive sampling to recruit six junior students and conducted face-to-face semi-structured interviews, using reflexive thematic analysis. Four themes (cultural types, cultural development, cultural connotations and cultural extension) were identified on campus culture perceptions established, while three themes (landscape identification, perception establishment and other influences) were identified for how they were established. Overall, students perceived the campus culture that the university planned to show in the design stage, but it also reflected that there was a hidden threat of discontinuity in the cultural transmission.

Keywords: university campus landscape, campus culture, perception, cultural transmission, cultural discontinuity

CHCD-B9 UNCOVERING CONTINGENCY AS DESIGN AFFORDANCE FOR MALAYSIAN TERRACED HOUSE – A CONCEPTUAL REVIEW

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The stereotypical approach of terraced house modification signifies a critical condition that the affordance of a terraced house is paralysed by image duplication and not possibilities of contingency. In response, this study explores the concept of contingency as affordance stimulation in transforming typicality. Such conception is speculated through architectural affordances, spatial domesticity, type-model, and contingency order. Cross-analysis of the theoretical framework shows that contingency is a manifestation of affordance. This formation perceived the terraced house as a type of cell corresponding to a relational system of situational qualities and not a fixed model of image type. Identified as a “Terraced Interiority System”, this systemic framework explored the dynamism of stimulative and projective cells in a terraced context as a spatial prompt. While it transformed terraced house design, this system potentially enriched the study of mass housing typology into cellular architecture and programs that corroborate contemporary culture.

Keywords: Terraced house design, Contingency affordance, Relational systematic framework, Stimulative projection, Cellular type architecture, Contemporary living

CHCD-B10 CHINESE PERANAKAN VERNACULAR ARCHITECTURE: A SOURCE OF INSPIRATION FOR CONTEMPORARY URBAN HOUSING SOLUTIONS

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This paper aims to discuss how the physical arrangement and community focused aspects of the Chinese Peranakan traditional houses in Kampung Tirok provide useful information for the design of modern houses in urban areas. Through the identification of the characteristics of the open yards and the flexible interior of these homes, this study seeks to establish how these elements helped in the management of privacy and social interaction as well as the improvement of family and neighborhood relationships. It examines how such architectural ideas can respond to the problems of social isolation and high population density by fostering togetherness, social cohesion and efficient use of land. Also, the existing housing projects with communal features are discussed to see how the principles of Peranakan incorporate design traditional can elements be into incorporated the into modern the day modern urban environment. This order is to the provide intention architects of with this fundamentals research to develop sustainable and culturally appropriate communities that promote health and togetherness in highly populated areas.

Keywords: Vernacular Design Adaptation, Spatial Organization, Chinese Peranakan Traditional Houses, Urban Housing Solutions

CHCD-B11 ISLAMIC SYMBOLISM IN RELIGIOUS LIFE AND CONTEMPORARY MOSQUE DESIGN: NAHDLATUL ULAMA AND MUHAMMADIYAH PERSPECTIVES

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Symbolism in Islamic teachings reflects spiritual and ethical values, influencing both individual behaviour and communal identity. In mosque design, it serves as a bridge between tradition and modernity. Balancing traditional symbolism with contemporary functionality poses challenges, addressed differently by Nahdlatul Ulama (NU) and Muhammadiyah due to their distinct Islamic traditions. This study explores the perspectives NU and Muhammadiyah, two major Islamic organizations in Indonesia, on Islamic symbolism and its role in religious life and mosque architecture. Using a qualitative case study approach, this research analyses the content of the in-depth interviews with organizational leaders in identifying the main themes and deepen the understanding of Islamic symbolism in mosque architecture. Findings indicate that both organizations seek to balance tradition and adaptation, using symbolism as a medium for da'wah and spiritual reflection. It is expected to contribute to the understanding amidst modern innovations in mosque architecture and to develop innovative Islamic symbolic design.

Keywords: Islamic symbolism, Mosque architecture, Nahdlatul Ulama, Muhammadiyah, Indonesia Islamic culture, Contemporary Islamic architecture

CHCD-B12 CONTEMPORARY LANDSCAPE DESIGN INSPIRED BY KAMPUNG TIROK CHINESE PERANAKAN COURTYARDS AND GARDENS

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The Chinese Peranakan traditional houses in Kampung Tirok have lovely gardens that merge nature and culture. These outdoor spaces discourage communal meetings. This study examines the organisation and architecture of these courtyards and gardens and their importance. By studying real-life Peranakan houses in Kampung Tirok, focussing on design, plant selection, water features, and indoor-outdoor flow. This study will examine how these characteristics promote natural cooling, effective air circulation, and eco-friendly water management methods that align with modern sustainable landscape design. The project will also examine how these design components might be adapted for metropolitan surroundings like housing complexes and public parks to promote eco-friendliness and heritage. The findings will help designers draw inspiration from Chinese Peranakan courtyards and gardens. They will propose urban design solutions that foster community interaction, enhance regions, and promote flexibility. This study emphasises the need to integrate history and conscience into landscape design.

Keywords: Courtyard Design, Culture Heritage, Chinese Peranakan Traditional Houses, Urban Green Spaces

CHCD-B13 DISCUSSION ON HISTORICAL HERITAGE AND BRAND INTERNATIONALIZATION PROMOTION STRATEGY - THE CASE OF SHAOXING, CHINA

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This study focuses on how Shaoxing can integrate its traditional cultural elements to enhance the global recognition and appeal of its city brand. Through literature analysis and public questionnaire surveys, the study reveals a significant divergence between public preferences, which favor emotionally resonant elements like Lu Xun culture and rice wine culture, and official strategies that prioritize market-oriented elements such as Yue opera and celebrity hometowns. The findings highlight the limitations of current promotional strategies and propose enhancing public participation, prioritizing widely recognized cultural elements, and constructing a diversified brand narrative to strengthen cultural identity and international competitiveness.

Keywords: brand internationalization, city brand construction, brand optimization, traditional cultural elements, cultural cognition and promotion

CHCD-B14 PERCEPTION AND DISPLAY OF FOLK ACTIVITIES IN CULTURAL SPACE – A CASE STUDY OF WEDDING OF DONG NATIONALITY

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This study examines the interaction between cultural space, social behavior and psychological perception in order to explore the role of Dong traditional weddings in constructing place identity. As an intangible cultural heritage, Dong weddings utilize specific spaces such as family courtyards, rural roads, and public wells, which are transformed into symbols of cultural identity and collective memory through ritual activities. These ceremonies express three core cultural connotations: identity and recognition, cooperation and cohesion, and blessings and festivals. By fostering emotional bonds, collective memory and cultural pride, weddings strengthen community ties and place identity. The study emphasizes the need to preserve the ceremony and its cultural space for the sustainable transmission of intangible heritage. The findings suggest that Dong weddings enhance community cohesion, provide insights into local governance, and encourage active participation in the preservation and utilization of cultural heritage.

Keywords: Cultural Space, Place Identity, Spatial Perception, Dong Traditional Wedding, Intangible Cultural Heritage

CHCD-B15 THE INFLUENCE ON THE ARCHITECTURAL WOODCARVING CRAFTSMANSHIP INHERITANCE: A SYSTEMATIC REVIEW

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This paper addresses the global issue of architectural homogenization and urbanization, which has eroded cultural identity and led to the decline of traditional crafts such as architectural wood carving. By systematically reviewing literature from major academic databases (Scopus and ScienceDirect) and following PRISMA guidelines, the study analyses the impact of architectural homogenization on the protection of architectural wood carving craftsmanship (PAWCC) in management literature. The review identifies cultural and ecological factors influencing the inheritance and conservation of architectural wood carving, explores gaps in the current literature, and proposes future research approaches. Using ATLAS.TI software for efficient and systematic analysis, the study finds that while architectural homogeneity has mixed effects, its overall impact on the innovation, inheritance, and market competitiveness of architectural wood carving is predominantly negative. The findings contribute to a conceptual framework for the inheritance and protection of architectural wood carving craftsmanship.

Keywords: architectural homogeneity, craftsmanship inheritance, craftsmanship protection, cultural identity, architectural wood carving

CHCD-B16 THE OUTSTANDING UNIVERSAL VALUE OF HERITAGE LANDSCAPE OF SHIPAI CAMPUS OF SOUTH CHINA UNIVERSITY OF TECHNOLOGY

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In the last century, a prestigious university was founded by Dr. Sun Yat-sen, which was later renamed National Sun Yat-sen University in his honor. Between the 1950s and 1960s, the university underwent significant restructuring, resulting in its division into multiple educational institutions and other types of entities. Among these newly established institutions, the Shipai Campus of South China University of Technology (SpSCUT) has emerged as the most esteemed. This study aims to investigate the Outstanding Universal Value (OUV) of heritage landscape of SpSCUT campus. The study utilizes a qualitative methodology, including case studies, literature reviews, archival research, site observations, in-depth interviews, focus group discussions, and the Delphi Method. The data analysis employs thematic analysis methods conducted by the NVivo. Seven categories of OUV of the SpSCUT campus have been identified and validated, including educational and research value, historical and cultural value, emotional value, aesthetic value, symbolic value, ecological value, and political value. The author emphasizes the necessity of conserving these ingredients to uphold the campus's OUV and advocates the establishment of a preservation framework for the site for future research based on this study. Moreover, the potential merger of the campuses of SpSCUT and SCAU requires further study.

Keywords: campus heritage landscape, outstanding universal value, South China University of Technology, Sun Yat-sen, National Sun Yat-sen University

CHCD-B17 EMPIRICAL STUDY ON COLOR DESIGN STRATEGIES FOR REGULATING URBAN VITALITY : A CASE STUDY OF MELAKA HERITAGE CITY, MALAYSIA

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Urban vitality, essential for sustainable cities, is significantly influenced by color dynamics in urban design. This study examines the role of color perception, preference, and schemes in enhancing the vitality of pedestrian streets in Melaka Heritage City, Malaysia, with a focus on the mediating role of emotional responses. Using a three-phase methodology, the research integrates computational analysis of streetscapes via Street View Images and Deep Convolutional Neural Networks, spatial analysis of urban vitality through Geographic Information Systems, and perceptual analysis via a structured visual questionnaire analyzed with Partial Least Squares Structural Equation Modeling. Results indicate that vibrant and harmonious color schemes enhance emotional engagement, which mediates their impact on urban vitality. The study contributes to understanding the interplay between color dynamics and urban vitality, offering practical insights for designing vibrant and emotionally engaging urban spaces, especially in heritage cities.

Keywords: Color Perception, Color Preference, Color Scheme, Emotional Response, Urban Vitality

CHCD-B18 MELAKA MALAY SULTANATE KINGDOM: TECHNOLOGY AND CIVILIZATION THROUGH HISTORICAL RECORDS

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The Melaka Malay Sultanate Kingdom before the 1511 Portuguese occupation had achieved tremendous technologies that curated its civilization. However, there is no physical evidences to reflect the technology though all those were portrayed in historical records. Therefore, historical records were extracted and later interpreted into technologies existed at that time. This study aims to identify those technologies during the reign that made Melaka renowned as entrepot hub. Later, most probable location of the enterprise/technologies site were dictated throughout Melaka land. The method focuses through historical sources and previous studies. The research tries to interpret the city during the reign of Sultanate as an empire with great technology to cater their environment, economic activities, and its people. From this research, locations of enterprise/technologies were obtained. This study can be a catalyst for deeper research about Melaka Malay Empire as one of the best entrepot city during the era.

Keywords: Melaka Malay Sultanate Kingdom, technology, location, civilization

CHCD-B19 ENHANCING INDOOR THERMAL COMFORT: ROOF DESIGN STRATEGIES FOR TRADITIONAL VERNACULAR MOSQUES

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Roof is the main building façade that offer protection from the physical elements and outdoor environments for its occupants. In the tropical climate, roof is the building element that is the most exposed to the sun, absorbed solar radiation then transferred the heat towards the interior of the building. Traditional vernacular mosque in Malaysia is always associated with traditional Malay house that portrays passive design approaches. One such approach is reflected in their roof design, which integrates natural ventilation strategies such as high-pitch roofs for stack effect, ventilated roof spaces, openings in roof segments to facilitate airflow and abundant windows and wall openings to enhance natural ventilation. The pyramidal roof not only enhances the building's aesthetic with multiple volume expressions but also provides excellent air ventilation, facilitating passive cooling within the interior space. This research aims to investigate the effectiveness of tiered pyramidal roof design in providing indoor thermal comfort. The inventory from five selected traditional vernacular mosques in Peninsular Malaysia are digitized and documented to their roof design, components, height, pitch ratio, and opening ratio. The study is a preliminary findings towards a detail study on the performance of natural ventilation for indoor thermal comfort in the traditional vernacular mosques.

Keywords: Natural ventilation, tiered pyramidal roof, thermal comfort, traditional vernacular mosque

CHCD-B20 REVITALIZING HERITAGE: INTEGRATING KAMPUNG TIROK CHINESE PERANAKAN TRADITIONAL HOUSES DESIGN PRINCIPLES INTO CONTEMPORARY SUSTAINABLE ARCHITECTURE

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This research seeks to explore how eco architectural methods found in Chinese Peranakan traditional houses—like natural cooling, natural lighting techniques and the strategic layout of spaces using indigenous materials—can be incorporated into modern sustainable building concepts. This research will investigate how design elements such, as natural cross ventilation systems and shaded outdoor areas align with contemporary sustainable design principles by considering their impact, on energy efficiency and environmental sustainability. The research will use a qualitative case research method to examine Kampung Tirok residences by conducting, on site observations and interviewing homeowner while referencing records. The results will demonstrate how these eco-friendly methods can be integrated into designs to enhance energy efficiency, sustainability and cultural preservation. This research aims to blend wisdom with advancements to suggest design approaches that respect cultural legacy and tackle current sustainability issues effectively. It provides valuable perspectives for architects dedicated to developing eco-friendly architecture sites.

Keywords: Sustainable Architecture, Passive Cooling, Chinese Peranakan Traditional Houses, Culture Heritage Integration

CHCD-B21 A COMPARATIVE STUDY OF BEIJING HUTONG “MICRO GARDEN”: ASSESSING RESIDENT PREFERENCES

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This research is a qualitative case comparison observational study that assesses the development status of three hutong micro gardens in Beijing’s Baita Hutong Community, Shijia Hutong, and Zhuanta Hutong. The study summarizes the types and characteristics of Hutong micro gardens and explores future directions for their renewal. The research aims to (1) understand Hutong residents’; behavioral preferences regarding the spatial functions, facility safety, and landscape vegetation of “micro gardens”; during their use, and (2) summarize the existing forms and characteristics of Beijing’s “micro gardens”;(3)Understand residents’; usage needs for Hutong “micro gardens”.

Keywords: Beijing Hutong, micro garden, residents, preferences, Service facilities, Landscape types, micro renewal

CHCD-B22 A STUDY ON RAISING TECHNIQUES AND SKILL DEVELOPMENT TO ENHANCE TACIT KNOWLEDGE TRANSFER IN BAI ETHNIC SILVERSMITHING

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Bai ethnic silversmithing in China has a history spanning several centuries, it has encountered the impact of mechanised production, the ageing of the artisans and fewer successors. The purpose of this study is to explore the characteristics of raising techniques and their tacit knowledge in Bai ethnic in order to enhance the efficiency of skills transfer to novices. This study uses a literature review, after title search and filtering out full research papers from year 2014-2024, The results lead to proposing a conceptual framework. It indicate that integrating the explicit knowledge of raising (rules and technology), the tacit knowledge of individual experts'; intuition (sound perception and eye behaviour), and their physical behaviour preferences. It can build a comprehensive expert skills database that improves the efficiency of skills transfer. This paper provides new perspectives on tacit knowledge to describe the raising techniques. These findings provide a valuable reference for craft training and preservation of the intangible cultural heritage.

Keywords: Tacit knowledge, raising techniques, Silversmithing, Experts' knowledge, Sound perception, Eye behaviour

CHCD-B23 INTEGRATION OF QAMARIYYT FEATURES IN MODERN HOUSES IN SANA'A YEMEN: A REVIEW PAPER

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This paper explores the integration of Qamariyyt features in modern residential architecture in Sana'a, Yemen, with a focus on cultural preservation, sustainability, and functional benefits. For over 4,000 years, qamariyyt, the traditional exposition of stained-glass windows, have served as one of the defining elements of Yemeni architecture. These windows allow light in while ensuring the privacy and elegance of the home. But the minimalist styles and industrial materials of tiny living have caused Qamariyyt to fall out of favour as people flock to more modern methods. This study analyzes the regards of their acceptance in today's architecture: economic relevance, the costs of materials, current trends and environmental effects. This paper used an approach of literature review, and more than 30 academic sources of journals, books, and research papers were analyzed to examine the conservation elements of Qamariyyt in terms of the preservation of culture and then energy conservation. The findings indicate that while modern construction techniques pose challenges to integrating traditional elements like Qamariyyt, these windows offer significant environmental and cultural value. The study emphasizes the importance of adopting innovative solutions to balance tradition with modernity, such as using hybrid materials and advanced construction techniques. The research contributes to ongoing discussions on cultural heritage preservation and sustainable architecture in Sana'a, providing insights into future architectural practices.

Keywords: Traditional facade, modern housing, Qamarriya

CHCD-B24 THE PHILOSOPHY OF TRADITIONAL MALAY ORNAMENTATION IN ARCHITECTURE: PRESERVATION OF MEANING AND CULTURE

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Traditional Malay ornamentation in architecture is rich with philosophy that reflects a deep relation between cultural identity, cosmological beliefs and aesthetic values of the Malays. These ornaments which are rooted in the historical and socio-cultural of the people in Malay Archipelago are not just for decorative purposes, but instead, they also serve as the embodiments of the Malays' spiritual and philosophical ideals. In traditional Malay architecture, ornamentation through intricate wood carvings with various motifs such as geometrics patterns and nature-inspired motifs convey deep meanings related to the Malays' culture, beliefs and values. These motifs are designed to express a holistic view of the Malays' universe in which the physical and metaphysical aspects are interconnected. The craftsmanship of Malay ornamentation in architecture are thus seen as manifestations of cultural continuity and a means of preserving traditional Malay wisdom, offering insights into the Malays' weltanschauung. This qualitative study aims to discuss the philosophies of traditional Malay motifs in architecture, to interpret the meaning behind the motifs and to relate the connection between decorative patterns and local culture as well as the diaspora of the Malay world. Based on the theory of form and soul by Syed Ahmad Jamal and a framework of the History of Muslim Art Tradition, this study concludes that traditional Malay motifs provided identification of locality and its carrier. It

also reflects the origin of the owner of decorative patterns (motifs) and serves as a method for identification. Both aspects of the study on appearances led to an understanding of the essence, including the recognition of culture and thought processes, philosophy, and their connection to historical events in the Malay world.

Keyword(s): Traditional Malay ornamentation, Malay philosophy, Malay motifs, aesthetics, symbolism



CHCD-B25 REVISITING THE ROLE OF NATURE-BASED DESIGN IN STRENGTHENING THE SENSE OF PLACE AT A TRADITIONAL MOSQUE: A CASE STUDY AT MASJID AR-RAHMAN, PULAU GAJAH

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A mosque is a sacred space for Muslims, serving as a place for private and public worship, and a centre for religious events. Developing a strong sense of place within a mosque is essential, as it enhances visitors' spiritual and emotional experiences, nurturing fundamental human values and enriching the soul. Nature-based or biophilic design is a key factor in contributing to this sense of place. However, research on the specific impact of nature-based design within traditional mosques is still limited. This study investigates the role of nature-based design on the sense of place at Masjid Ar-Rahman, Pulau Gajah, a traditional mosque. A sequential mixed-method research design was employed, incorporating observations, questionnaires, and interviews for data collection. Quantitative data were analysed using descriptive and inferential statistics, while qualitative data were analysed through content

analysis. The results then were triangulated. The results indicate that all nature-based design patterns are crucial in creating a strong sense of place as those patterns and elements enrich spiritual connection, healing purposes and architectural appreciation. These elements contribute significantly to fostering spiritual and emotional well-being. The study provides new insights into how nature-based design can enhance the sense of place within a mosque.

Keywords: nature-based design, biophilic design, sense of place, mosque, traditional



CHCD-B26 MALAY TEXTILE TRADITION: THE FORGOTTEN ART OF NATURAL DYEING

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Natural dyeing in the Malay Peninsula has been integral to the creation of vibrant and culturally significant textiles. Through various extraction processes and ingredient combinations, mesmerising tones and shades have been achieved, as seen in well-preserved textile artefacts housed in museums across Malaysia. However, the advent of synthetic dyes and modern textile practices has led to the decline of this heritage craft. This study explores the historical significance and techniques of natural dyeing, focusing on one of the most prominent red dye sources used in Malay textiles; the sappanwood (sepang). The observation of the traditional techniques involved literature, interviews and experimentation. Results reveal the intricate processes of red dye extraction using single boiling with simultaneous mordanting technique, which produce rich and diverse hues. By documenting these methods and emphasising their cultural importance, the study advocates for the revival and preservation of natural dyeing techniques as a means to safeguard Malay cultural identity.

Keywords: Malay textiles, natural dyes, traditional dyeing, red dye, cultural heritage, textile preservation

CHCD-B27 A LITERATURE REVIEW: ENHANCING CULTURAL PERCEPTION THROUGH EXPERIENTIAL SERVICE DESIGN IN TAOIST HERITAGE TOURISM.

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Cultural tourism increasingly emphasizes spiritual well-being, as tourists want meaningful experiences and cultural comprehension. Nonetheless, Taoist tourism in China faces challenges due to commercialization, which often leaves visitors with superficial experiences and affects the preservation of Taoist traditions. Service design provides a means to refine visitor interactions and elevate the entire experience. This study reviews relevant literature to identify the main features of Taoist cultural tourism and proposes a framework to use service design methods for improving tourist experiences. The research presents a conceptual framework for enhancing tourists' understanding and intensifies their cultural involvement, thereby augmenting their experience. The study seeks to enhance the theoretical foundation for implementing service design in tourism experiences, specifically within the realm of Taoist cultural tourism in China.

Keywords: Taoist Culture Tourism, Service Design, Culture Heritage, Tourism Experience, Cultural Perception

CHCD-B28 FACTORS INFLUENCING TOURISTS' WILLINGNESS TO PAY FOR INDUSTRIAL HERITAGE TOURISM: A CASE STUDY IN JINGDEZHEN, CHINA

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Buildings, machinery, and other remnants of the industrial legacy were preserved and repurposed as tourist attractions to attract visitors [1]. Industrial heritage tourism serves as a critical driver for social and economic development and has considerable value in tourism, leisure, education, cultural promotion, and preserving spiritual heritage. [2- 4]. This study focuses on Taoxichuan Ceramic Cultural and Creative Park in Jingdezhen, known as the “Porcelain Capital of China,” as a case study to investigate the factors influencing tourists’ willingness to pay (WTP) in the context of industrial heritage tourism. Grounded in the principles of perceived value theory, this research develops a theoretical model to explore the relationships among tourists’ perceived value, satisfaction, and WTP. The study adopts a quantitative approach, collecting survey responses from 445 tourists. Structural Equation Modeling (SEM) was employed to analyze the data and test the proposed hypotheses. The findings reveal that WTP is positively associated with tourists’ monthly income and educational level, while showing minimal correlation with gender and age. Furthermore, the four dimensions of perceived value—functional, social, emotional, and epistemic—are found to positively influence WTP. Tourist satisfaction acts as a mediating variable between perceived value and WTP, highlighting its importance in enhancing payment behaviors. This study provides significant theoretical and practical contributions. For policymakers and decision-makers, the findings offer actionable insights to optimize the design, operation, and

management of industrial heritage sites, such as Taoxichuan Ceramic Cultural and Creative Park. By aligning future designs with tourists' perceived value dimensions, operational efficiency and visitor satisfaction can be improved. Additionally, this research serves as a reference for the sustainable development and management of similar industrial heritage tourism destinations. Future studies may extend this framework to other industrial heritage sites to validate and expand its applicability.

Keywords: Industrial Heritage Tourism, Perceived Value Theory, Tourist satisfaction, Tourists' willingness to pay (WTP), Structural Equation Modelling (SEM)



CHCD-B29 EXPLORING THE IMPORTANCE OF HISTORIC PORT CITIES: A CASE STUDY ON THE STRAITS OF MELAKA

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Port city architecture offers visitors a visual representation of the cities' busy local culture and mix of traded traditions, and social interactions and trading networks. This research aims to explore the importance of historic port cities within the Melaka Straits from an architectural perspective without downplaying their historical significance. The objectives are to identify their architectural elements, examine their relationship to their historical significance, and discuss the application of urban regeneration of historical port cities. The research methods are content analysis, comparative studies, and case studies of historical port cities. Findings highlighted the identification of building typologies in port cities, an understanding of their architectural development historically, and an appreciation of the importance of preservation. In conclusion, urban conservation should ideally be an exercise that not only focuses on preservation but also contributes to the preservation of cultural traditions and helps them to survive in the face of environmental change.

Keywords: architectural heritage, historical port city, urban regeneration

CHCD-B30 CRAFTING PERSUASIVE ADS: KEY DESIGN ELEMENTS DRIVING SUSTAINABLE CONSUMPTION AMONG CHINA'S GENERATION Z

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Port city architecture offers visitors a visual representation of the cities' busy local culture and mix of traded traditions, and social interactions and trading networks. This research aims to explore the importance of historic port cities within the Melaka Straits from an architectural perspective without downplaying their historical significance. The objectives are to identify their architectural elements, examine their relationship to their historical significance, and discuss the application of urban regeneration of historical port cities. The research methods are content analysis, comparative studies, and case studies of historical port cities. Findings highlighted the identification of building typologies in port cities, an understanding of their architectural development historically, and an appreciation of the importance of preservation. In conclusion, urban conservation should ideally be an exercise that not only focuses on preservation but also contributes to the preservation of cultural traditions and helps them to survive in the face of environmental change.

Keywords: architectural heritage, historical port city, urban regeneration



**C.THEME 3: HEALTH AND WELL-BEING IN
BUILT ENVIRONMENT (HWB)**

HWB-C1 RESEARCH TRENDS IN AGE-FRIENDLY CITY STUDIES IN RELATION TO ACTIVE AGEING AND SUBJECTIVE WELL-BEING

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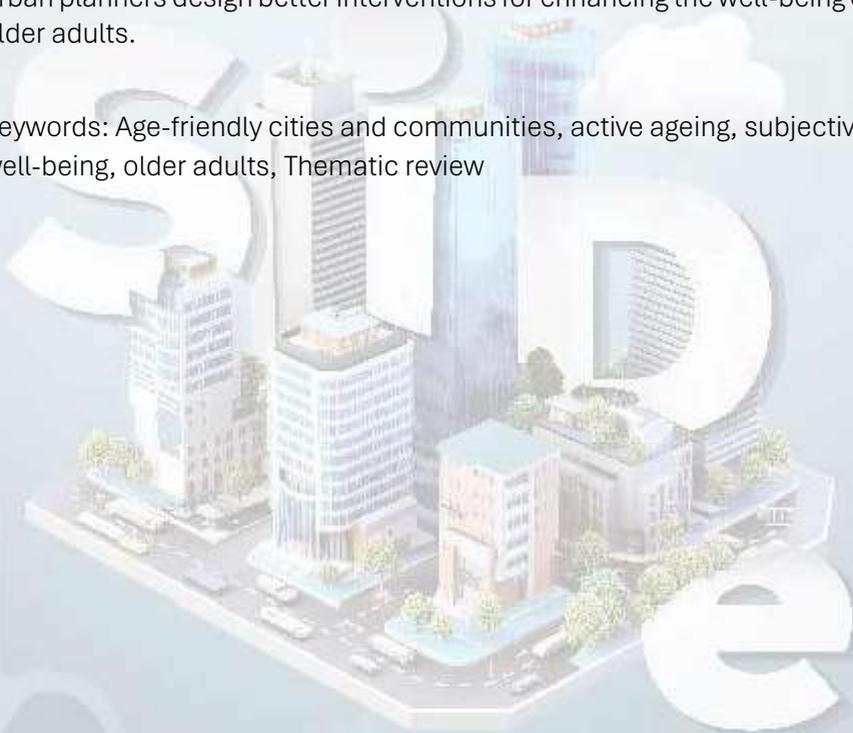
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The age-friendly city (AFC) concept, introduced by the World Health Organization (WHO), is becoming increasingly relevant as urban populations age, particularly in promoting active ageing and enhancing subjective well-being. Despite extensive literature, the impact of AFC initiatives on subjective well-being remains fragmented, warranting a need for integrated frameworks. This thematic review aimed to analyse trends in AFC studies related to active ageing and subjective well-being from 2007 to 2024 by highlighting key themes and gaps for future research, supported by the WHO's AFC and active ageing concepts and the Ecological Model of Ageing. The current study utilised the TreZ method, a structured, systematic review process which involved an article screening process through keyword search strategies. As a result of using two major databases, Scopus and Web of Science (WoS), a total of 43 journal articles were analysed through ATLAS.ti 8 software. The review identified five key themes: (i) Age-Friendly Environment, Health, and Well-Being, (ii) Integration of Age-Friendly and Active Ageing Frameworks, (iii) Mobility and Accessibility in Age-Friendly Communities, (iv) Comparative and Socio-Cultural Dimensions of Age-Friendly Environment, and (v) Assessment and Contemporary Development in Age-Friendly Cities. The results suggested that while the field is

expanding, the interplay between age-friendly environment, active ageing, and subjective well-being remains unclear. Though some useful journal papers might be left out due to the search limitations, such as keywords used and exclusion criteria, this study offers a structured synthesis of trends in AFC research, contributing to a richer understanding of the relationships. Future research should explore localised, comparative, and longitudinal evaluations to refine AFC frameworks, considering emerging issues like digitalisation and ethical considerations in urban planning for ageing populations. The findings will help policymakers and urban planners design better interventions for enhancing the well-being of older adults.

Keywords: Age-friendly cities and communities, active ageing, subjective well-being, older adults, Thematic review



HWB-C2 IMPACT OF VERTICAL GREENING SYSTEMS ON PARTICULATE MATTER IN CHINA: A REVIEW

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In recent years, vertical greening systems (VGS), or green façades (GF), have gained prominence as a sustainable strategy to reduce urban particulate matter (PM), a major health and environmental concern. This systematic review examines the impact of VGS on respirable PM concentrations in Chinese cities by analyzing empirical and case studies up to 2024. The review considers vegetation type, VGS type, experimental methods, location, climate, and outcomes. Results indicate that VGS significantly reduces respirable PM in urban areas by capturing particles on plant surfaces, which are removed via natural processes like rainfall. Effectiveness varies based on plant species, wall coverage, height, and environmental conditions. Optimizing VGS design for local conditions can enhance its air purification benefits, making it a viable solution for densely populated urban areas in China. Future research should refine plant selection and design strategies to maximize PM mitigation.

Keywords: Vertical greening systems, Particulate matter, Urban environments, Sustainability, Air quality

HWB-C3 EMPHASISING ISLAMIC VALUES IN HOSPITAL DESIGN: A PATH TO ENHANCE THE HEALING PROCESS

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This study investigates the integration of Islamic values into hospital design in Malaysia, where healthcare holds profound significance in the Islamic faith. A modern hospital, especially an Islamic Concept Hospital (ICH), often lacks environments that holistically address physical, emotional, and spiritual needs, particularly from an Islamic perspective. The research aims to identify design criteria for ICH that incorporate Islamic values while meeting the needs of a multiracial community. Using qualitative methods, including multiple case studies and thematic analysis with ATLAS.ti, the study examines policies, strategies, and design approaches of five private and one government ICH. Results reveal eight main criteria categorised into tangible and intangible parameters. These findings, which emphasize values of mercy and compassion, align with Islamic teachings and global sustainability goals. The practical implications of these findings are significant, as they provide a design guideline for ICHs that can enhance healing environments, foster inclusivity, and contribute to improved healthcare standards in Malaysia.

Keywords: Healthcare architecture, Islamic values, healing by design

HWB-C4 INNOVATIONS IN HEALTHY HOUSING: BALANCING AESTHETIC DESIGN WITH HUMAN HEALTH PRIORITIES

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The evolving landscape of residential architecture calls for innovations that integrate health and aesthetic seamlessly. This study investigates emerging strategies that priorities occupant well-being without compromising design appeal, focusing on sustainable materials, biophilic design, smart technologies, and universal accessibility. Through three residential case studies, enriched by interviews with designers, this explores how the elements enhance indoor air quality, mental well-being and inclusivity while maintaining architectural integrity. Key findings reveal how materials with low emissions, nature inspired features, and intelligent systems optimise health outcomes, demonstrating the transformative potential of technology and design synergy. The study proposed actionable guidance for integrating these innovations into residential projects, providing architects, designers and policymakers with practical tools to create healthier, visually engaging living environments. Shifting beyond traditional health-focused categories, this research offers a forward-thinking perspective on achieving harmony between aesthetic and well-being in contemporary housing.

Keywords: Aesthetic Design, Biophilic Design, Healthy Housing, Health-Focused, Residential, Smart Technologies, Ventilation

HWB-C5 CONCEPTUALIZING AGEING IN PLACE: A STRUCTURAL EQUATION MODEL ANALYSIS FOR THE ELDERLY IN MALAYSIA

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This paper investigates aging in place among older adults in Malaysia, focusing on the interrelated roles of assistive technology, quality of life, and age-friendly environments in supporting ageing in place. As Malaysia's senior population is projected to increase from 10.3% in 2020 to 15.3% by 2030, the need for effective strategies to enable aging in place has become increasingly urgent. Drawing on survey data from 499 participants aged 60–75, this research examines the influence of assistive technology on physical health, psychological well-being, and social engagement, demonstrating significant enhancements in quality of life. Additionally, age-friendly environments contribute to autonomy by mitigating environmental barriers. However, adoption challenges, including financial constraints and limited technological proficiency, impede the effectiveness of assistive technologies for some seniors. This paper highlights the necessity of a balanced approach that integrates both technological and human support, offering insights for policymakers to develop interventions that uphold the autonomy and dignity of older adults in Malaysia.

Keywords: Ageing in place, assistive technology, quality of life, age-friendly environment, Structural Equation Modelling (SEM)

HWB-C6 IMPROVING THERMAL COMFORT FOR THE ELDERLY: A REVIEW

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Thermal comfort for the elderly is severely challenged by factors such as reduced self-regulation and poor health. However, there are few summaries on thermal comfort in the elderly, that hindering our understanding of their thermal comfort needs. This study selects articles on specific topics using keywords, conducts cross-analysis, and summarizes the influencing factors, data collection methods, and evaluation methods related to thermal comfort for the elderly. The review identifies that the primary influences on thermal comfort in the elderly encompass physical, physiological, psychological, and socio-cultural factors. Physical and physiological factors are measured through direct assessment or simulation, whereas psychological and socio-cultural factors are derived from subjective surveys. Currently, simulation, measurement, and subjective surveys represent the predominant data collection methods for assessing thermal comfort. This review provides a comprehensive understanding of the key elements of thermal comfort for older

adults and can create a better outdoor environment for them.

Keywords: The elderly, Outdoor thermal comfort, Influence factors, Data method

HWB-C7 DEVELOPMENTS OF FENESTRATION TO ENHANCE STUDENT WELL-BEING FOR THE LIBRARY BUILDING UNIVERSITIES

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People spend over 90 percent of their lives indoors, thus, the indoor environmental quality very essential for human well-being. Poor fenestration is a major risk to human well-being. Building is not sustainable for living if it's unhealthy. Since we can't control humans to keep themselves healthy individually, then we have to improve building performance to be healthier for its occupants. This review summarizes about fenestration importance in building to prevent users from sick building syndrome SBS. The later COVID-19 was good evidence, of how the buildings and closed area is helpful in disease separation. Society has gotten to be clearly mindful that there are still undesirable concentrations inside its environment. Narrow space and lack of openings inside the building are the main factors of this problem. The spaces in the building must not only be functional, sustainable, and aesthetically pleasing but they must also be safe, comfortable, and most importantly, healthy. The study discusses how the development of fenestration can change the building environment and focuses on the developing fenestration design in buildings to provide an optimal building environment, that can provide appropriate sunlight, ventilation, and a better view to improve indoor life quality for human well-being. This study is associate of indoor air quality, sunlight and ventilation in universities library buildings for students' well-being. Improvement in fenestration to increase sunlight and ventilation in building design was a good factor to improve students' well-being in building compared to typical fenestration with a lack of sunlight and ventilation. Increasing and enhancing natural lighting and natural ventilation has a significant positive effect and strong impact on human well-being.

Keywords: Fenestration, Sunlight, Ventilation, Sick Building Syndrome (SBS), Human well-being, Architecture and health

HWB-C8 IMMERSIVE NATURE: THE IMPACT OF VIRTUAL REALITY ENVIRONMENTS DURING CLASS BREAKS

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Mental health issues among students attending lectures pose a significant concern, potentially negatively impacting their academic performance and overall well-being. A growing body of previous research suggests that virtual nature experiences, like those in a virtual reality (VR) environment, can yield significant positive effects. Therefore, the objective of this study is to evaluate the restorative impact of virtual reality nature environments on students during their class break. This study employs a questionnaire survey to assess the restorative outcome scale and involving 140 students from the public universities in Malaysia. The VR intervention was tested using a nature environment setting. Data were analysed using descriptive statistics, focusing on the mean. The results showed that students reported a relatively high level of restoration. These findings suggest that VR can be beneficial in addressing mental health challenges during class breaks.

Keywords: Mental health problem, restorative effect, virtual reality, student, nature environment, well being

HWB-C9 QUALITY OF LIFE IN MALAYSIA'S OLD PUBLIC HOUSING: A COMPARATIVE STUDY OF ENVIRONMENTAL CONDITIONS IN SRI SELANGOR AND RIFLE RANGE FLATS

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The Malaysian government has started various programs for housing for low-income people on old public housing (OPH) are being implemented to ensure affordability for all citizens of Malaysia. However, the quality of life at existing OPH should also be upgraded towards sustainability. The objective of this paper is to investigate the quality of life (QoL) in the environment living in old public housing OPH. Therefore, this paper identifies the issues of sustainable community living in OPH in the cities of Kuala Lumpur and Penang. This was achieved through a mixed method research approach that covered two areas of case studies in Sri Selangor flat and Rifle Range flat. This study discusses how low-income community behaves towards current and OPH in terms of planning and design which might affect residents from different backgrounds in terms of age, race, religion, and the elderly. Currently, there is a considerable amount of new quality OPH development in Klang Valley which inevitably affects community living at the long-established OPH as new low-cost

housing with communal areas have a different scenario from the old ones. Sustainable community in a Public Housing (PH) city people need to transform their living space more comfortable and have a quality of life in living condition in the future living in cities.

Keywords: Old Public Housing, Quality of Life, Environmental, Condition, Well-being



HWB-C10 RESEARCH ON THE HEALING RESIDENTIAL SPACE DESIGN STRATEGY OF LEFT-BEHIND CHILDREN IN CHINA

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With the advancement of China's urbanization process, more rural parents choose to work in cities, resulting in a large number of children left behind in the countryside. This study aims to provide a living environment conducive to physical and mental health for left-behind children, pay attention to the psychological needs of left-behind children, and propose corresponding design strategies from the perspective of healing living space design. In order to verify the effectiveness of these design strategies, this study adopted the literature review method and field investigation method to analyze the basic situation and psychological problems of left-behind children, and selected some families of left-behind children as research objects to conduct field investigations. Through data collection and analysis, it is found that through reasonable design strategies, the mental health status of left-behind children has been significantly improved. In conclusion, this study provides theoretical basis and practical guidance for the therapeutic living space design of left-behind children.

Key words: left-behind children; Healing living space; Design strategy; Mental health

HWB-C11 DEVELOPMENT OF BIOPHILIC DESIGN ELEMENTS AND ATTRIBUTES FOR A RESTORATIVE INDOOR OFFICE ENVIRONMENT IN MALAYSIA

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This study develops biophilic design elements to create restorative indoor office environments tailored to Malaysia's unique climate and culture. Starting with Kellert's original 72 attributes, a desk review reduced the list to 57, refined to 34 attributes through focus group discussions with design and psychology experts. Recent studies have further expanded biophilic design frameworks by integrating urban outdoor elements with indoor environmental quality factors, emphasizing human comfort and sustainability. Key elements identified include Natural Ventilation, External Views of Nature, and Chromotherapy, all shown to support stress reduction and productivity. These findings inform a biophilic design model tailored to Malaysian government offices, promoting well-being and performance through restorative, nature-integrated spaces.

Keywords: Biophilic Design, Malaysian Offices, Stress Reduction, Productivity Enhancement, Restorative Indoor Environment



**D.THEME 4: TRANSFORMING SOCIAL
BUILT ENVIRONMENT (TSBE)**

TSBE-D1 INTEGRATING ARTIFICIAL INTELLIGENCE (AI) IN ARCHITECTURAL PRACTICE AND EDUCATION

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The integration of Artificial Intelligence (AI) in architecture is revolutionizing both professional practice and educational domains by enhancing creativity, efficiency, and adaptability in design processes. However, despite its transformative potential, research exploring the intersection of AI and architecture remains limited, underscoring the need for further scholarly inquiry. To address this gap, a systematic review was conducted using a structured approach known as the TreZ method, involving major databases such as SCOPUS, Web of Science (WoS), Mendeley, and Semantic Scholar. The review employed targeted keywords, including “Artificial Intelligence in Architecture,” “Architectural Practice,” “Architectural Studies,” and “Education.” This systematic search yielded 16 relevant articles that reflect current trends and applications of AI in architectural education and practice. The findings provide a comprehensive overview of the research landscape, offering valuable insights for academics and practitioners to identify emerging themes and opportunities for future research on AI integration within architecture.

Keywords: Artificial Intelligence, AI in Architecture, AI Architectural Practice, AI in Architectural Studies and education, Thematic review

TSBE-D2 OPTIMIZING STREET TREE SELECTION MODEL FOR SUSTAINABLE URBAN LANDSCAPES IN MALAYSIA

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Urban street tree management presents complex challenges, particularly in rapidly urbanizing regions where environmental stressors and infrastructure conflicts are prevalent. This study addresses the critical need for a robust tree species selection model tailored to urban environments, focusing on the integration of tree morphology to enhance the sustainability and functionality of urban forestry. The research explores the limitations of existing frameworks, such as those by Amir and Misgav (1990), Miller (1997), Roy (2015), and Ramly (2018). This model incorporates advanced methodologies like Partial Least Squares Structural Equation Modelling (PLS-SEM) to validate species selection criteria that account for environmental resilience, social acceptance, and economic viability. The findings highlight the importance of considering tree morphology characteristics such as root structure, canopy size, and growth patterns in species selection to prevent infrastructure damage, reduce maintenance costs, and ensure long-term ecological benefits. The study concludes that integrating morphological characteristics into selection models is essential for developing urban forests that are not only resilient to climate change and urban stressors but also capable of providing significant ecological and social benefits. This research contributes to the advancement of urban forestry practices by offering a scientifically validated, context-sensitive framework that can be adapted to various urban environments globally.

Keywords: Urban forestry, tree morphology, species selection, Partial Least Squares Structural Equation Modelling (PLS-SEM)

TSBE-D3 KEY FACTORS IN OPTIMIZING KINDERGARTEN LANDSCAPES TO IMPROVE LEARNING ENVIRONMENTS

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In China, children aged 3 to 6 spend most of their time in kindergarten, making the landscape environment of kindergartens crucial for their development and education. Although the Kindergarten Guidelines emphasize its importance, the educational potential of kindergarten landscapes in China remains underexplored. This study reviews literature related to educational environments in Chinese kindergartens, horticultural and landscape design, and improvements in learning environments. It adopts Ibrahim's (2008, 2011) RQ structure ("WHO," "WHAT," and "HOW") to explore how landscapes align with the educational goals of early childhood education. The findings indicate that integrating landscapes can enhance children's cognitive, social, and emotional development. The study provides theoretical and practical guidance, proposing strategies such as emphasizing plant species diversity, layout optimization, and scientific daily maintenance to improve learning interest and engagement. New perspectives are also offered for landscape design and policy development.

Keywords: Chinese Children, Kindergarten Landscapes, Learning Environments, Regional Landscapes, Kindergarten Education

TSBE-D4 TEACHING PEDAGOGY IN STUDIO-BASED LEARNING: THEMATIC REVIEW

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Education in design, especially architecture, where practical, hands-on experience is crucial, is centred mostly on studio-based learning. Likewise, students are progressively pursuing academic experiences for the learning, application, and achievement of competency-based abilities. The review of teaching pedagogy in studio-based learning remains scarce. Therefore, this thematic review paper explores the various teaching methods, styles, and pedagogical approaches employed in studio-based learning environments. This thematic review article (TR) seeks to synthesize research from 2019 to 2024 addressing teaching methodology in studio-based learning (SBL) with Atlas.ti 23 software. This study conducted a thematic review (TR) from the Scopus and Emerald database, identified 47 peer-reviewed journal articles, and analyzed them regarding Technology Integrated Blended Learning, Collaborative Participatory Learning, Experiential Learning, Interdisciplinary Integrated, and Personalized Evidence-Based. The review highlights the importance of adapting teaching practices to meet diverse student learning styles and preferences, emphasizing a student-centred approach. The study offers insights into how these methods can be leveraged to improve learning outcomes, foster collaborative learning, and prepare students for professional practice. The findings and recommendations will help future research on moving towards innovative teaching pedagogy in-studio learning and future guidelines for physical space that align with the teaching pedagogy.

Keywords: studio-based learning, architectural education, pedagogy, teaching methods, studio pedagogy, innovative pedagogy

TSBE-D5 THINKING FRAMEWORK OF MASTER CRAFTMAN LATIF LONG TOWARDS PRODUCTION OF CREATIVE WORKS

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This paper discusses the core aspects of producing creative work, with a particular focus on creative thinking. A lack of creative thinking among architects has resulted in poor quality and a lack of originality in architectural styles in Malaysia today. This issue stems from architects; limited creativity and inadequate understanding of contextual needs. One of the contributing factors to this problem is the absence of a framework to guide creative thinking, particularly in design. To address this, the thesis focuses on a renowned Malaysian craftsman, Latif Long, to explore the aspects of creative thinking. Two objectives were formulated to achieve this goal: the first was to identify the principles of Latif Long's work, and the second was to establish the foundational thinking framework that Latif Long employs in producing creative works. This research utilized qualitative methods, including interviews and content analysis of manuscripts belonging to Latif Long. The study identified four key aspects of Latif Long's creative thinking in his work: background knowledge, aesthetic principles, workflow, and dissemination of knowledge. This study contributes to the development of creative thinking skills and the establishment of a framework to guide the production of creative works, particularly for architecture students.

Keywords: Creative thinking guideline, creative product

TSBE-D6 THE GOVERNANCE OF TELECOMMUNICATIONS INFRASTRUCTURE IN MALAYSIA: AN EXPLORATION INTO THE CHALLENGES OF LOCAL AUTHORITIES

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The paper examines the challenges surrounding the development of telecommunications infrastructure in Peninsular Malaysia, focusing on the implementation of the Planning Guideline of Communication Infrastructure (GPP-I) introduced by the Malaysian Communications & Multimedia Commission. Malaysia recognises communication services as an essential public utility, alongside water and electricity since 2021. However, the progress of telecommunications infrastructure development in the country has been slow, leading to delays in service provision. As such, the paper has an objective, which is to uncover the challenges faced by the local authorities in facilitating the planning and development of telecommunications infrastructure; and from the findings the paper is able to make recommendations in improving the telecommunications infrastructure ecosystem in Malaysia. This study employs an exploratory and qualitative approach to achieve the objectives where it gathers insights through focus group discussions allowing for exploration of context-specific challenges. Using thematic analysis, the study provided an understanding of the barriers to policy

implementation at the local level. Data was collected from July 2024 to October 2024 with a total of 12 willing officers representing a diverse geographic range from Malaysia’s northern, central, southern, and east coast regions. Key findings highlight issues of operational inconsistencies facilitated by general technical comments during planning permission, power struggle between local authorities and Principal Submitting Person (PSP) in the process of Certificate of Completion and Compliance (CCC) approval, as well as variability in the interpretation of the word “telecommunications”. The recommendations outlined in this study underscore the importance of coordinated efforts to accelerate the deployment of communication infrastructure in Malaysia. By addressing these challenges, the country can enhance digital connectivity, promote equitable access, and strengthen its position as a leader in the digital economy.

Keywords: Telecommunications Infrastructure, Governance, Local Authority, Public Utility, Planning Guidelines



TSBE-D7 THE AUTO-CHECKING COMPETENCY FRAMEWORK: VALIDITY OF JAPAN AND THE UK

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The adoption of BIM e-Submission systems and automated compliance checking (ACC) in Malaysia has highlighted critical gaps in occupational competencies, especially within the socio-regulatory context of local authorities. This study establishes the Auto-Checking Competency Framework tailored for Malaysia through validation with experts in Japan and the UK. Employing a structured methodology, including the DDR approach—Model Research (Type 2)—and the DACUM technique, experts' inputs were collected and analyzed across Kirkpatrick's Four Levels of Training Evaluation Model: 1—Reaction, 2—Learning, 3—Behaviour, and 4—Results. Findings emphasize the need for technical proficiency, regulatory knowledge, and role specialization in local authorities to address competency deficiencies, streamline processes, and align with global standards. Japan's and the UK's best practices offer key insights into adapting BIM e-Submission to regional contexts, underscoring the importance of advanced technologies and tailored training. This study contributes to Malaysia's BIM-skilled workforce development, offering a structured digital transformation training pathway.

Keywords: BIM e-Submission, Automated Compliance Checking (ACC), Competency Framework, Design and Development Research (DDR), Developing A CUrriculUM (DACUM), Kirkpatrick's Four Levels of Training Evaluation

TSBE-D8 NAVIGATING SUPPLY CHAIN MANAGEMENT IN CONSTRUCTION: CHALLENGES AND KEY SUCCESS DETERMINANTS FOR SME CONTRACTOR ORGANIZATIONS

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Supply chain management (SCM) is important for organizational success in the current dynamic and uncertain business landscape. Good SCM practices will enhance efficiency, minimize risks, and support construction growth. However, the rise of volatility, uncertainty, complexity, and ambiguity (VUCA) in the construction sector has significantly affected business performance, leading to delays, increased costs, and operational inefficiencies. This study aims to identify the challenges faced by SME contractors in SCM during disruptions and analyze the critical determinants of successful SCM for SME organizations. This study is developed based on an extensive literature review as a platform for developing a supply chain resilience framework for SME contractor organizations. A total of twenty-five (25) challenges in SCM were identified, and the determinants of success were categorized into five themes: market-based capabilities, financial capabilities, collaboration and communication, and technology integration. The outcomes of this study will help contractors build resilience and adapt to a rapidly changing environment.

Keywords: Supply Chain Management, challenges, determinants, contractor, resilience

TSBE-D9 DEVELOPING A DISPUTE PATHOGENS FRAMEWORK IN BIM IMPLEMENTATION AMONG MALAYSIAN PUBLIC SECTOR PROJECT SUPPLY CHAINS

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This research intends to establish an authentic dispute pathogens framework assessment in BIM implementation among Malaysian public sector project supply chains. The Fuzzy Delphi Method (FDM) was incorporated to identify the root cause of BIM implementation disputes among Malaysian public sector project supply chains. Specifically, Focus Group Discussion (FGD) was utilized for dispute pathogens framework development. Resultantly, the pathogen organization indicated the highest dispute pathogens framework level that impacted BIM practices among Malaysian public sector project supply chains. Insufficient internal specialists or highly qualified personnel and the segmented industrial nature induced a silo mindset, inadequate experience in BIM projects, conventional mentality, high short-term expenditure (training, review development, and hardware and software acquisition), and insufficient information were observably the root cause of disputes with substantial effects to navigate Malaysian public sector project supply chains using BIM implementation. Disputes among Malaysian public sector project supply chains regarding BIM implementation led to construction time and work delays, high expenses and workloads, and insufficient BIM implementation-based advantages. In this vein, BIM implementation disputes among Malaysian public sector project supply chains must be crucially regarded to encourage BIM implementation among Malaysian

public sector project supply chains (in line with the dispute pathogens framework) to facilitate decision-makers through dispute pathogens in Malaysian public sector project supply chains.

Keywords: BIM implementation, Dispute pathogens framework, Malaysian public sector, Fuzzy Delphi Method (FDM), Focus Group Discussion (FGD)



TSBE-D10 ENHANCING ENERGY-SAVING BEHAVIOUR THROUGH THE INTEGRATED TECHNOLOGY ENGAGEMENT CANVAS FOR HOUSEHOLDS (iTECH)

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Home technology adoption in Sustainable Smart Cities (SSCs) is essential for reducing carbon emissions, yet household engagement remains limited. Prior studies proposing energy-saving strategies often lack theoretical grounding, leading to ambiguity in key behavioural influences. This paper addresses this gap by developing the integrated Technology Engagement Canvas for Households (iTECH) to promote energy-saving behaviour (ESB). Through an integrated literature review of cognitive and technology adoption theories, a novel framework is proposed. A systematic review of 24 Scopus-indexed studies reveals that over a third advocate knowledge enhancement strategies to improve technology's usefulness, foster responsibility, and encourage adherence to social norms. However, strategies linked to beliefs, personal norms, and awareness of consequences are rarely addressed. These findings address the ambiguity surrounding ESB strategies and underscore the significance of tackling this issue through the iTECH framework. By offering insights into a more holistic approach to encouraging energy-saving behaviour, this research contributes to the advancement of sustainable practices in residential settings within SSCs.

Keywords: energy saving behaviour, smart city, technology, sustainability, energy efficiency, systematic review

TSBE-D11 DISTINGUISHING DETERMINANTS OF BUILDING OBSOLESCENCE: INSIGHTS FROM THE LOCAL MALAYSIAN CONTEXT

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A gradual process of obsolescence especially around urban area has been taking place in Kuala Lumpur city centre, one of Malaysia's metropolitan cities, endangering both the ongoing urban life and the physical structure that have been inherited from the past to the current modern era. Building obsolescence often leads to decreased property value and may necessitate regeneration intervention to remain relevant or useful. Nonetheless, different types and levels of building obsolescence requires different regeneration approaches. Thus, the purpose of this study is to distinguish the types and level of building obsolescence. Employing qualitative approach involving semi-structured interviews and field observations, the findings indicate that building obsolescence can be distinguished based on three determinants which are causal factors of the building obsolescence, usability and the building condition. A number of discussions and recommendations are highlighted, in the hope that the information can be useful to determine the best strategies that can further improve the management of building obsolescence through sustainable urban regeneration.

Keywords: Types of building obsolescence, urban regeneration



E. THEME 5: HUMAN-CENTERED DESIGN & ENGAGEMENT (HCDE)

HCDE-E1 OPTIMIZING VISITOR ENGAGEMENT THROUGH INTERACTIVE DISPLAY FACILITIES IN MODERN MUSEUMS: INSIGHTS AND INNOVATIONS

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With the development of information technology, museum display methods have gradually shifted from traditional static exhibitions to innovative formats based on technologies such as Augmented Reality (AR) and Virtual Reality (VR). Although museum visitor experience and satisfaction have become focal points of academic research, studies on how these innovative display methods impact visitor experience and satisfaction remain limited. This paper takes the “Return to Sanxingdui” exhibition at the Sichuan Museum as a case study to explore the role of exhibition content, display technologies, overall organization, and reception services in enhancing visitor experience and satisfaction. Based on a questionnaire survey of 329 randomly selected visitors and employing correlation analysis, Importance-Performance Analysis (IPA), and Net Promoter Score (NPS) methods, this study evaluates the performance and optimization potential of different display methods. The findings reveal the potential of innovative technologies in enhancing immersion, while also highlighting the limitations posed by issues such as equipment stability and interaction design. This paper provides theoretical support for the innovation of museum service models and offers practical insights for improving exhibition design and visitor management in the future.

Keywords: Interactive Displays, Museum Engagement, Visitor Experience, Exhibition Design

HCDE-E2 NEO-ENDOGENOUS RURAL DEVELOPMENT RENEWAL, LANDSCAPE SPATIAL PLANNING COMBINED WITH THE ACTIVITY DESIGN.

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The rural area owns special historical characteristics and resource identities. It received a lot of concerns in the modern development process. New endogenous development is an important way to achieve rural revitalization which focuses on local resources and community participation. However, the neglect of synergies between landscape spatial planning and activity design makes it difficult to have an integrated impact on endogenous village development. Effective combination provide a more integrated and diverse framework of community needs, and will promote community participation in both the planning and implementation phases. The study was conducted as a case study in Jianlou village in Changsha, China. The general objective is to develop an effective community participation model in both the planning and implementation phases. Tides wisdom, Acupuncture solutions, and Endogenous connections are the key methods through the village renewal and activities process. Endogenous power is revealed and has produced a deep influence on rural residents'; life happiness and village vitality. This study is an essential experience for authorities in promoting rural endogenous development in the research location and can be applied in other areas with similar characteristics.

Keywords: Rural resources, landscape spatial planning, activity design, environment renewal, rural endogenous

HCDE-E3 THEMATIC REVIEW OF DESIGN FACTORS AND APPLICATION PERSPECTIVES TO ENHANCE SATISFACTION OF INDOOR SMART GARDENS AMONG THE ELDERLY

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Indoor smart gardens represent an innovative advancement in urban agriculture, with significant potential to enhance the quality of life of elderly users. This review examines key design factors and application perspectives to enhance elderly satisfaction with indoor smart gardens, derived from an analysis of 25 studies. The findings are organized into five central themes: user-centred design and accessibility, multisensory and emotional well-being, technological integration and automation, interaction and community engagement, and sustainability and environmental impact. The study underscores the importance of inclusive design, automation, community-driven approaches, and sustainable practices as fundamental to developing elderly-friendly smart garden environments. Indoor gardening, particularly through the use of efficient hydroponic systems, introduces plants such as fresh vegetables and herbs into elderly living spaces, creating a pleasant indoor environment and fostering both physical and mental well-being. This benefit is especially significant for individuals with restricted outdoor access. By incorporating innovative design practices, indoor smart gardens have the potential to greatly enhance elderly users' satisfaction and quality of life.

Keywords: Aging, indoor smart gardens, design factors, the satisfaction of the elderly, thematic review

HCDE-E4A SYSTEMATIC ANALYSIS OF CONSUMER BEHAVIOUR IN THE DECISION-MAKING PROCESS FOR PURCHASING RUNNING SHOES

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The study investigates the intricate relationship between consumer behaviour and decision-making in the context of purchasing running shoes, with a particular focus on the impact of the COVID-19 pandemic on traditional shopping behaviours, which often led to rushed and suboptimal purchasing decisions. This research aims to understand how decision-making influences the selection of running shoes, emphasizing ergonomic and aesthetic values, and explores the role of cultural and behavioural factors in shaping visual product assessments and design quality. Utilizing the Analytic Hierarchy Process (AHP), the study evaluates running shoes based on comfort, design, price, and durability through a structured hierarchy and pairwise comparisons. The findings reveal that ergonomic and aesthetic values significantly influence consumer behaviour through visual assessments. The tension between ergonomic and aesthetic considerations complicates the design process, leading to inefficient workflows and higher costs. The study contributes to knowledge by emphasizing a holistic approach to product design that balances ergonomic functionality and aesthetic appeal, thereby enhancing user experience and engagement. The “Ergo-Aesthetic” design approach integrates these considerations to meet consumer demands for comfort and style. By incorporating input from designers, manufacturers, and retailers, businesses can better understand consumer choices, leading to improved decision-making, product development, and competitive advantage.

Keywords: consumer behaviour, ergo aesthetic, running shoes, sight behavioural, decision making

HCDE-E5 DEVELOPING A CMFPSE CONCEPTUAL FRAMEWORK BASED ON CMF TO ENHANCE SMART PRODUCT MARKET COMPETITIVENESS

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As smart products become more prevalent, the role of CMF (Color, Material, Finish) in shaping user perception and experience has expanded, increasing the market competitiveness of these products. To investigate the key factors contributing to a CMF framework for smart product design, a four-step research methodology was adopted. This process identified key factors, leading to the proposal of an extended CMFPSE (Color, Material, Finish, Pattern, Sense, Emotion) framework, aimed at enhancing smart products' competitiveness by addressing functional, sensory, and emotional dimensions. The CMFPSE framework incorporates additional design considerations such as user interface touchpoints and dynamic responsiveness, with the goal of driving consumer loyalty and market success. The study concludes that strategic CMF elements can enhance brand storytelling, appeal to specific demographics, and inform consumer behavior research by focusing on aesthetics, functionality, and emotional impact on user preferences, particularly in wearable products, thereby increasing market competitiveness and customer retention.

Keywords: CMF, CMFPSE, Conceptual Framework, Smart Products, Product Design

HCDE-E6 ENGAGING COMMUNITIES IN THE DESIGN OF ELDERLY HOUSING: A COMPREHENSIVE APPROACH TO AGEING IN PLACE IN MALAYSIA

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By 2035, Malaysia's ageing population is projected to reach 5.6 million, posing significant challenges in housing, particularly for elderly individuals seeking to age in place. The current housing stock is inadequate in terms of accessibility, affordability, and suitability, especially for elderly individuals with mobility or functional disabilities. This study aims to explore the housing needs of Malaysia's elderly population, focusing on their perspectives to support ageing in place. Using a qualitative approach namely semi-structured interviews was conducted to assess elderly-friendly housing requirements. Key findings indicate that open-concept homes, safety, security, and accessibility are crucial for elderly individuals. Specific design suggestions include wheelchair-accessible spaces, well-lit corridors, slip-resistant flooring, and access to green open spaces. The study emphasizes the importance of collaborative efforts from policymakers, architects, and communities in addressing the needs of the ageing population, ensuring they can live with dignity and independence in their homes.

Keywords: Elderly housing, Ageing in Place, Home Design, Community Engagement, Sustainability



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